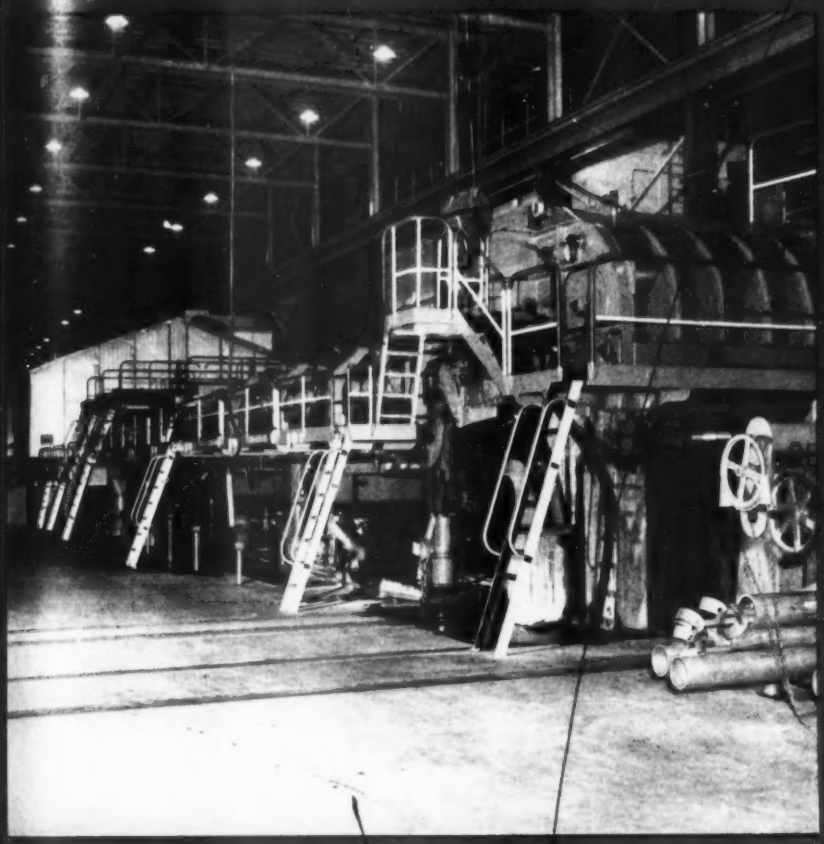
NOVEMBER 1960

The Paper Industry



View of the new Black-Clawson 236-in.-wide board machine now in operation at the Marathon Southern Corp. Naheola mill.

- Marathon Southern Corp.'s new board mill
- How to save money on depreciation
- Application of pipe, fittings, pumps and valves on the paper machine
- Rheology and the paper coater

Publishers of PAPER AND PULP MILL CATALOGUE

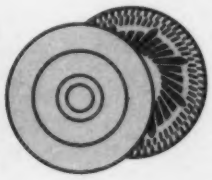
Push Button Precision and rugged construction identify the Raffinator Disc Refiner. The Raffinator is exclusive among disc refiners in having a hydraulic system for accurate, finger-tip control over disc positions at all times. Visual indicator shows plate settings magnified 80 times. Operates also on floating principle to allow for varying stock pressures.

Raffinator Disc Refiners are superbly engineered precision machines for all types of defibrating, and pump through or pressure refining at up to 20% consistency. Operates at speeds of 700-1000 rpm. All parts in contact with pulp stock are stainless steel. Refining discs are available in 24″, 36″, or 50″ diameters — in a variety of types and materials. Extra large shaft diameter prevents deflection in disc settings. Split shell facilitates precision plate adjustment and removal.

Introducing

THE

RAFFINATOR

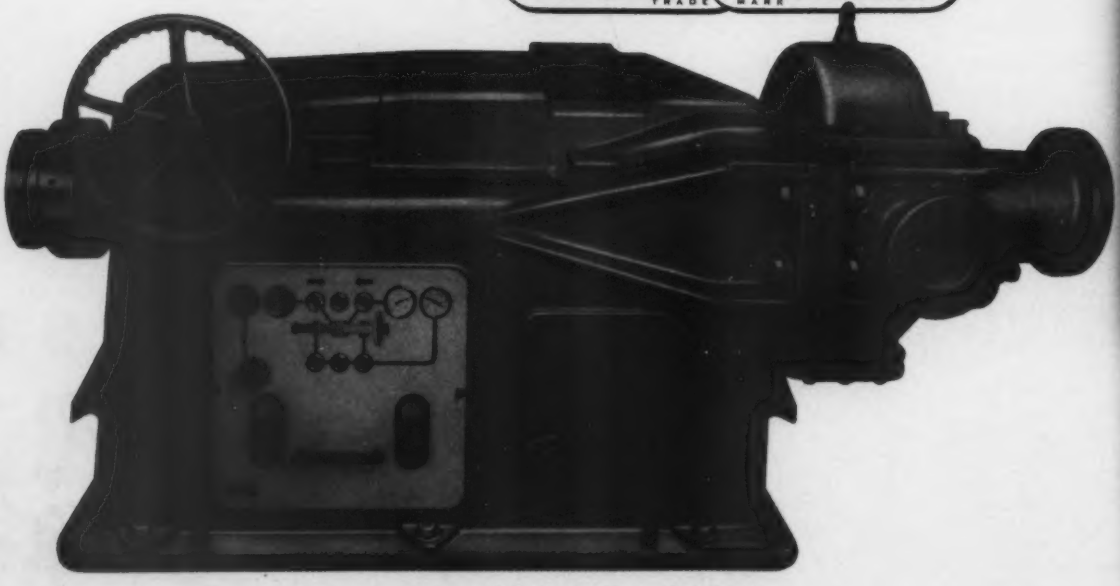


DISC REFINER

The Raffinator is delivered complete with electrical control panel. Even with its many unusual performance features, it is priced competitively with conventional disc refiners. Before selecting a disc refiner, it is wise to investigate the extraordinary advantages found in the Raffinator — already proved in over 600 mill installations.

Raffinator Disc Refiners, product of Swedish design and engineering, are now available in North America through Bolton-Emerson. For full information, contact *The Emerson Manufacturing Co., Division of John W. Bolton & Sons, Inc., Lawrence, Massachusetts.*

BOLTON EMERSON
TRADE MARK



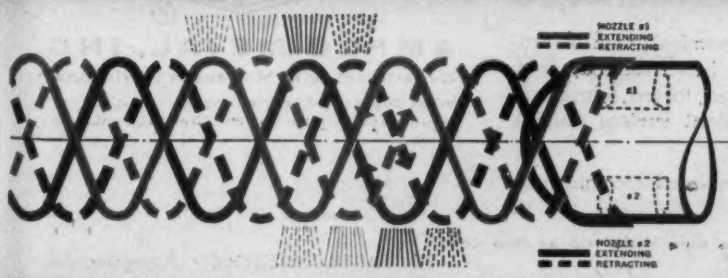
For more data circle 101 on Post Card

Diamond developed for more economical power...

A CLEAN SWEEP...EVERY INCH OF THE WAY

Get uniform, complete cleaning in those "tough-to-clean" zones. Specify Diamond's IK-300 Retractable Blower. The exclusive close-spaced IK helix assures a penetrating nozzle sweep every inch of travel regardless of tube bank arrangement and tube spacing. What's more, because sectionalized lance tube construction cuts deflection to a minimum, smaller boiler cavities are possible. In addition, a unique method of equalizing nozzle end-thrust assures "minimum-wobble" travel regardless of distance.

IK's are just part of the reason behind Diamond's established superiority in boiler cleaning systems. Add a complete line of cleaning equipment, an experienced, imaginative engineering staff and an unmatched service organization. No wonder thousands of utility and industrial power plants are equipped with Diamond Cleaning Systems — engineered and designed to provide you with more economical power.



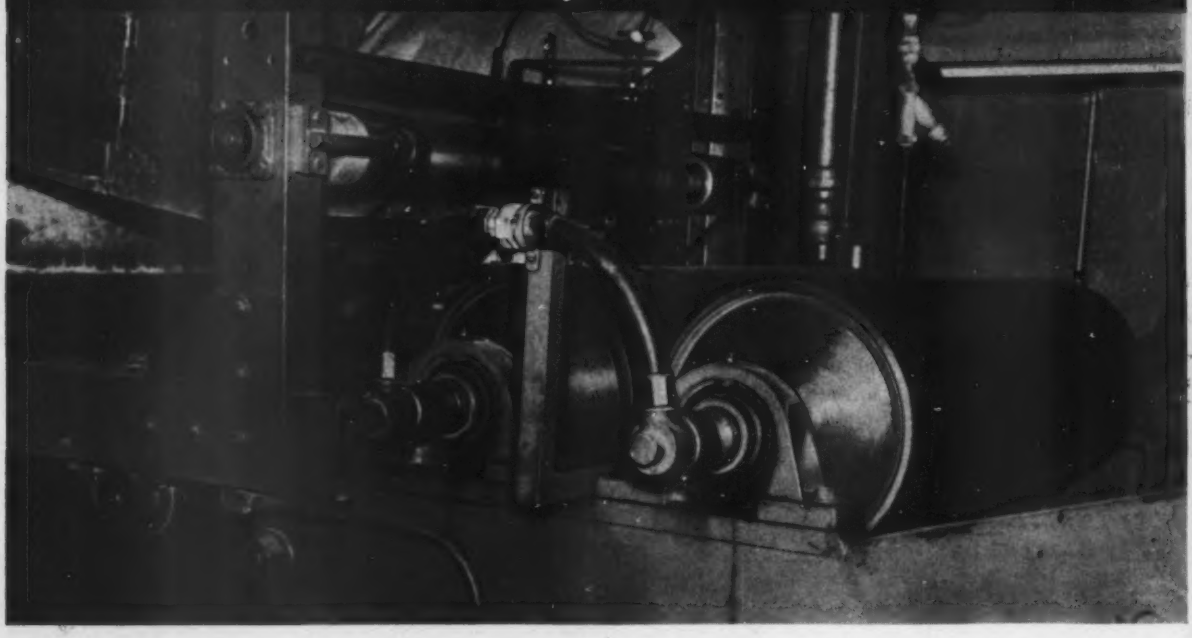
Diamond

DIAMOND POWER SPECIALTY CORPORATION, Lancaster, Ohio • Diamond Specialty Limited, Windsor, Ontario

Profitable paper-mill applications...

Centrifugally cast, finish-machined sleeves, 20¼" O.D. Thickness of fin .035", height of fin .875". Weight, 289 lbs.

These two Ampco Cooling rolls replaced four cast-iron rolls — needed no chrome plating. Cleaning and maintenance practically nil.



Corrosion can be licked – from pH 3 up – *with* AMPCO ALLOYS

Corrosion-resistance is just one characteristic of Ampco aluminum-bronze alloys. Physical properties far exceed those of the ordinary brasses or bronzes — resist wear and abrasion much longer. They provide high heat transfer.

You have flexibility in selecting the most economical form of production. Ampco alloys are readily sheared, bent, formed, deep drawn, and/or welded. They can be cast, extruded, forged, fabricated, and machined. (Ampco alloys take an excellent surface finish.) Also available as sheet and plate.

Call in an Ampco field engineer and get his unbiased recommendations. Write for bulletins.

AMPCO®

AMPCO METAL, INC.

Department 401K, Milwaukee 1, Wisconsin

West Coast Division: Huntington Park, California
Southwest Division: Garland (Dallas County), Tex.

TS-18

For more data circle 103 on Post Card

The Paper Industry

Technology • Engineering • Management • Production

VOLUME 42 **NUMBER 8** **NOVEMBER 1960**

Features . . .

Editorial — 15th Tappi Engineering Conference characterized by high-quality papers and discussions 549

Whither? — Effect of some organic substances on oxygen absorption in bubble aeration — Vacuum requirements for paper machines — Radiant heat for paper drying — Ductile iron in the pulp and paper industry — Alkaline digester corrosion 632

Marathon Southern Corp.'s new board mill in operation 562
by A. W. J. Dyck

Selection of valves in the pulp and paper mill 569
by Leo Walter

Have you considered oil-immersed controls for problem areas? 571
by T. F. Bellinger and R. F. Schoof

The use of pipe, fittings, pumps and valves in the pulp and paper industry: Part XIV 573
by Roland L. Allen Jr.

How to save money on depreciation 575
by Paul Lockwood

Rheology and the paper coater: Part I 576
by William R. Willets

Our best safety efforts are demanded 581

Consolidated receives recognition at 1960 NSC meet 587

Tennessee dedicates first industrial tree seedling nursery 595

Two research firms join together to speed food and drug compliance 595

Forestry notes 596

Recent expansions in the industry 598

News . . .

News of the Industry 595
Names in the News 603
Necrology 607

Departments . . .

Current Comments 591
Coming Events 601
Foreign Abstracts 610
Patent Reviews 614
New Products 617
New Literature 625
Market Quotations 629
Index to Advertisers 631

The PAPER INDUSTRY is indexed regularly in Engineering Index and Industrial Arts Index. An index to each volume is issued annually by the publisher as a part of the April number.

© 1960 by Fritz Publications, Inc.

Published monthly by:
FRITZ PUBLICATIONS, INC.
Edward B. Fritz (1869-1939), Founder

Publication Staff:

President and General Manager
A. SCOTT DOWD

Secretary
EDLA DURBON

Editorial Director
A. W. J. DYCK, Ph.D.

News Editor
BRUCE H. BRAMMER

Editorial Assistant
SUSAN E. HENRY

Market Analyst
JEROME KASSIDAY

Advertising and Production Manager
CHARLES E. DOWD

Production Assistant
SEVER M. PEDERSON

Circulation Manager
JOHN H. REARDON

Assistant Circulation Manager
LEONA M. NUTTALL

Advertising Representatives:

CHICAGO 5: **Jack Henderson,** 431 South Dearborn Street, Wabash 2-3543

CLEVELAND 7: **Richard E. Cleary, Inc.,** 15515 Detroit Avenue, Lakewood 1-7125

EASTERN: **Charles G. Peck,** 299 Madison Avenue New York 17, N. Y., Murray Hill 2-2499

SOUTHEASTERN: **Fred W. Smith,** 1201 Forest View Lane — Vesthaven, Birmingham 9, Ala., Tremont 1-5762

WEST COAST: **Murray Bothwell,** 234 East Colorado St., Pasadena, Calif., Murray 1-9155

THE PAPER INDUSTRY—founded in 1919—known as "The Paper Industry and Paper World" from June, 1939, through December, 1949, assumed its original title with the January, 1950 issue.

Published at 1501 Washington Road, Mendota, Illinois.

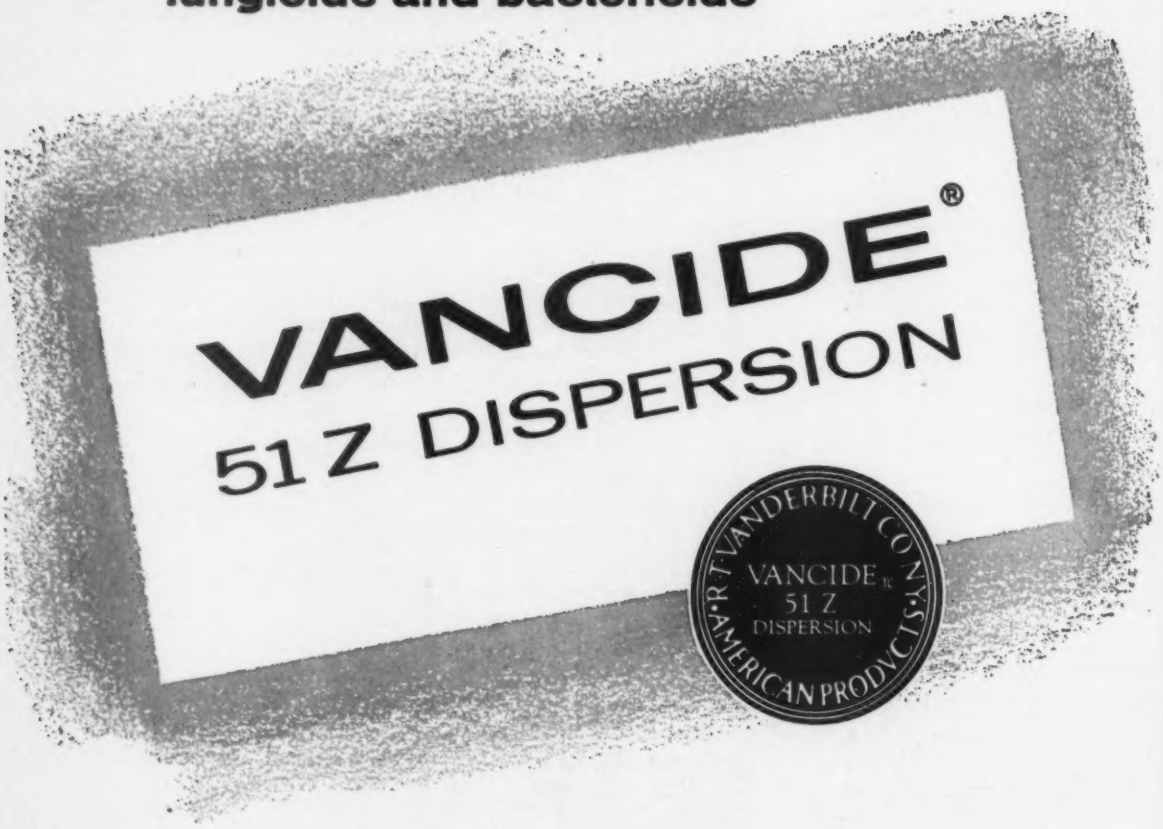
Address all correspondence to:
Fritz Publications, Inc.
431 South Dearborn Street
Chicago 5, Illinois

Member: Business Publications Audit of Circulation Inc.

Accepted as controlled circulation publication at Mendota, Ill.

Subscription rates: United States, U. S. Possessions and Canada $3.00 for one year. All other countries, $8.00 for one year, $18.00 for three years, payable in advance in U. S. Funds.

A powerful and effective fungicide and bactericide



Safe for use as recommended as a Slimicide in Food Paper and Paperboard

R. T. Vanderbilt Co., Inc.

230 PARK AVENUE • NEW YORK 17, N. Y.

For more data circle 104 on Post Card

From our point of view..

15th Tappi Engineering Conference characterized by high-quality papers and discussions

One could not help but be impressed with the high quality of papers presented at the 15th Tappi Engineering Conference held at the Robert Meyer Hotel, Jacksonville, Florida, on October 23-27.

The pulp and paper industry has suffered in the past from a lack of factual knowledge about the processes involved in pulp and paper making. In addition, the often inadequately interpreted experiments and wrong conclusions have added to the confusion and production difficulties.

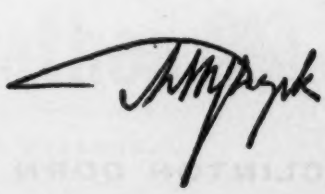
Such shortcomings were not reflected in the papers presented at the 15th Engineering Conference. On the contrary, many papers were characterized by their fundamental approach — and away from the conventional — to the problems of pulp and paper making. Even papers which of necessity had to deal with corrective rather than basically new measures showed a wealth of original thinking and a wholesome appreciation of the real problems facing the industry.

Among the papers that drew more than usual interest were those discussing the subject of air-impingement drying, while papers on related subjects dealt in considerable detail with the application of radiant heat in paper drying.

Of special interest to us, in view of the article in this issue on Marathon Southern Corp.'s new paperboard mill, was the new concept for varying and controlling crown on paper machine calender rolls disclosed at the meeting. This nip-loading control of calender rolls is now successfully operating on one of the calenders installed at this mill.

In line with this new concept, the crown of the roll can be varied through the application of pressure by means of floor-mounted hydraulic cylinders connected to the load bearings of the extended bottom roll journals. The device enables Marathon to produce uniform sheets of paperboard, irrespective of the required caliper and basis weight changes associated with different grades of paperboard. This is quite an advantage since, as pointed out by Joseph E. Perkins of Black-Clawson Co., ideally and for best results, a mill should use a different crown on the calender for each different loading and different grade of sheet run.

While the paper industry has a long way to go to break away from its conventional approach to pulp and paper making, it is the fundamental approach of the high quality of papers presented at this conference that will be instrumental in accomplishing the desired goal and do away with a great deal of opinionated conclusions that are based on incorrectly assessed observations.



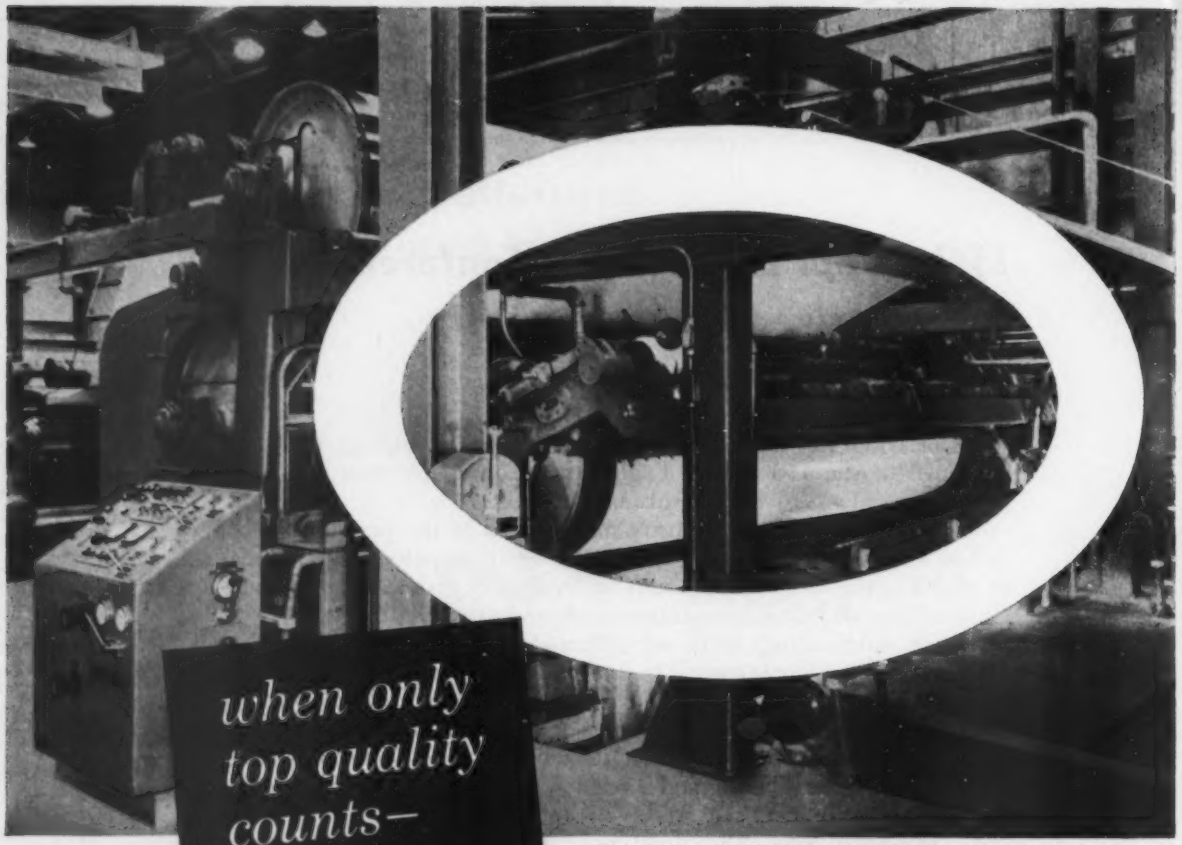


Photo Courtesy RICE BARTON CORPORATION, Worcester 1, Massachusetts

count on

CLINTON CORN STARCHES

for TRAILING BLADE COATING

CLINCO OXIDIZED STARCHES

Today's high-speed coating techniques call for color formulations with high solids and high viscosities. To meet these needs, CLINTON recommends CLINCO Oxidized Starches which offer a marked increase in ink "holdout", greater uniformity of coating on the sheet and better acceptance of the coated surface for printing inks. The next time you make a formulation for use in the trailing blade coater, find out what CLINCO 330-B, CLINCO 314-B, and CLINCO 55 can do for *you!*

TECHNICAL SERVICE
on specific problems is yours on request.
We'd like to be of service. Just write.

CLINTON

CLINTON CORN PROCESSING COMPANY, CLINTON, IOWA

For more data circle 105 on Post Card

Buyer's Memo to Himself:

Need supplier with know-how Call Marathon

A DEPENDABLE SOURCE FOR QUALITY CONVERTING MATERIALS

The ablest personnel in the paper business staff Marathon operations in all parts of the country. Mill managers, technicians, woodlands supervisors, engineers—all know their business thoroughly. Their talents are at your service.

Keep Marathon in mind for pulp, printing papers, paperboard and specialty materials.

Pulp, Paper and Paperboard Department

marathon

A Division of American Can Company

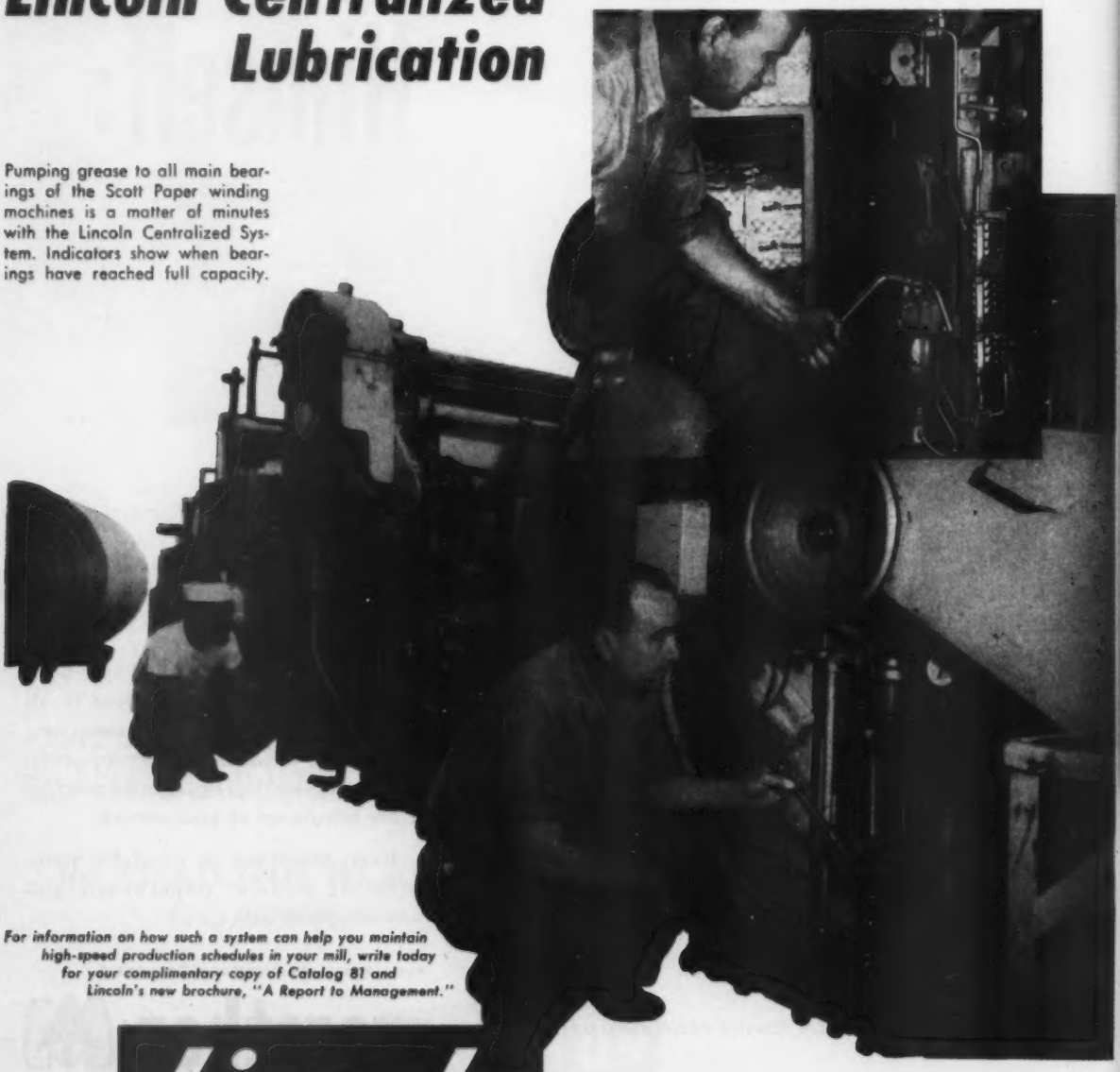
MENASHA, WISCONSIN

For more data circle 106 on Post Card

Scott Paper Company maintains round-the-clock operation with *Lincoln Centralized Lubrication*

Lincoln Centralized Lubricating Systems help keep the high-speed tissue winders in regular production at Scott Paper Company's Chester, Pa., plant. The Lincoln system substantially reduces the lubricating time of the handpump method. It's safer and more efficient. And it saves cleanup time, too—a most important factor in a plant where highest standards of cleanliness must be maintained at all times.

Each Scott Paper wrapping machine has 40 to 50 bearings. Many of them would be hard to reach even if the machine were stopped for hand lubrication. The Lincoln Centralized System feeds the right amount of lubricant to all bearings with machine at full speed.



Pumping grease to all main bearings of the Scott Paper winding machines is a matter of minutes with the Lincoln Centralized System. Indicators show when bearings have reached full capacity.

For information on how such a system can help you maintain high-speed production schedules in your mill, write today for your complimentary copy of Catalog 81 and Lincoln's new brochure, "A Report to Management."

Lincoln

1060

LINCOLN ENGINEERING CO.
Division of The McNeil Machine & Engineering Co.
4010 Goodfellow Blvd. • St. Louis 20, Mo.

For more data circle 107 on Post Card

BACHRACH

SERVICE:

In addition to providing papermakers with felts of the highest quality, we at Albany Felt Company recognize a second, most basic obligation to our customers . . . *service.*

But service can only be as good as management's intent. The quality of the service we have offered has been a special pride of our company for 65 years.

May I reaffirm to my numerous friends in the paper industry that the Albany Felt Company will continue its dedication to the firm principle that our service to papermakers shall be complete and unexcelled.

John C Standish

President and
Chairman of the Board of Directors

ALBANY FELT COMPANY
ALBANY, N.Y.
AF

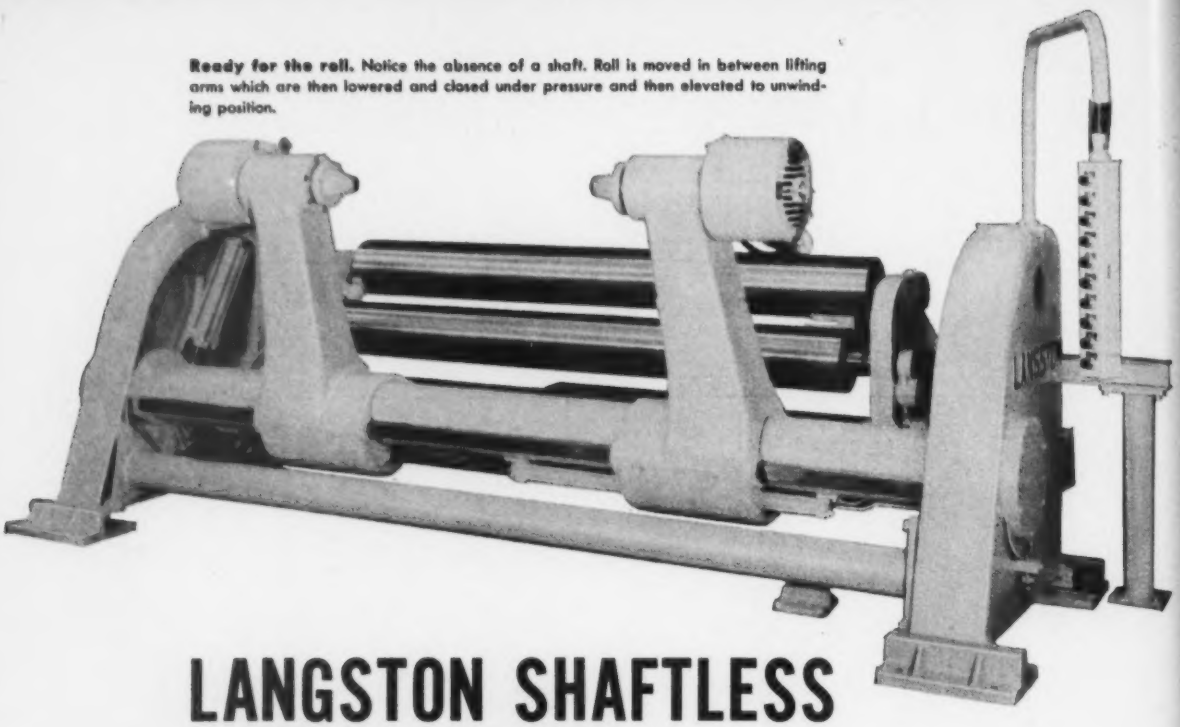
Dedicated To Paper Industry Progress

N. Monmouth, Maine Hoosick Falls, N. Y. St. Stephen, S. C.
Cowansville, Quebec Cuautitlan, Mexico

TALK IT OVER WITH YOUR ALBANY FELT SALES ENGINEER

960

Ready for the roll. Notice the absence of a shaft. Roll is moved in between lifting arms which are then lowered and closed under pressure and then elevated to unwinding position.



LANGSTON SHAFTLESS UNWIND STAND

Boost your production . . . reduce your slitting and rewinding costs

Easy, fast, completely safe. One man does everything. Operating pushbutton controls, he closes lifting arms, elevates roll, sets brakes.

One man can load the heaviest roll. No heavy shaft to handle. No cone tightening. No couplings to engage. No crane lifting. Just pushbuttons. This is the Langston standard shaftless unwind stand for rewinding and converting applications.

You not only save time, you also get better unwinding. Roll can be positioned laterally by pushbutton control—even when the machine is running. It's held firmly under pressure for complete safety throughout the unwind. Several braking arrangements can be provided to handle a wide range of grades and conditions. Available extras provide for handling very narrow rolls; for constant tensioning; for automatic braking of idler rolls; for automatic web alignment and side register control; for web oscillation; and for local or remote control.

This new Langston shaftless unwind stand can be used with any make of slitter. Available for maximum roll widths from 36 to 140 in. and diameters from 14 to 84 in. For complete information, write Samuel M. Langston Co., Camden 4, N. J.

SHEAR CUT CLEAN CUT

LANGSTON *Leadership...by design*

For more data circle 109 on Post Card

Don't Tackle "Alligatoring" with a Blunderbuss!

use **Penford Gum**

Among the conditions that can interfere with the printability of coated paper is patterning—or "alligatoring" as it is sometimes called. This surface mottling may pass unnoticed until the paper is printed, then show up clearly in screened and solid-color areas. When you convert starch yourself, you risk "alligatoring"—and rejected orders because of it.

Fortunately, this condition can be avoided with starch derivatives, the Penford Gums, the modern approach to coating problems. Modern because a Penford Gum is made to order for your needs, to strictly controlled viscosities, and is uniform all the way through. The strong adhesive quality of Penford Gum allows the use of less binder and more pigment, while its improved dispersing property distributes pigment effectively. And because of Penford Gum's exceptional bound-water content, the coating remains on the surface long enough to be leveled uniformly.

These are just a few of the reasons why you get stronger, more even coatings with Penford Gum and hence greatly improved printability in your sheet. One of our technical service representatives will be glad to come to your plant to show you how Penford Gum can help you improve your paper without increasing costs. Call or write Penick & Ford today.

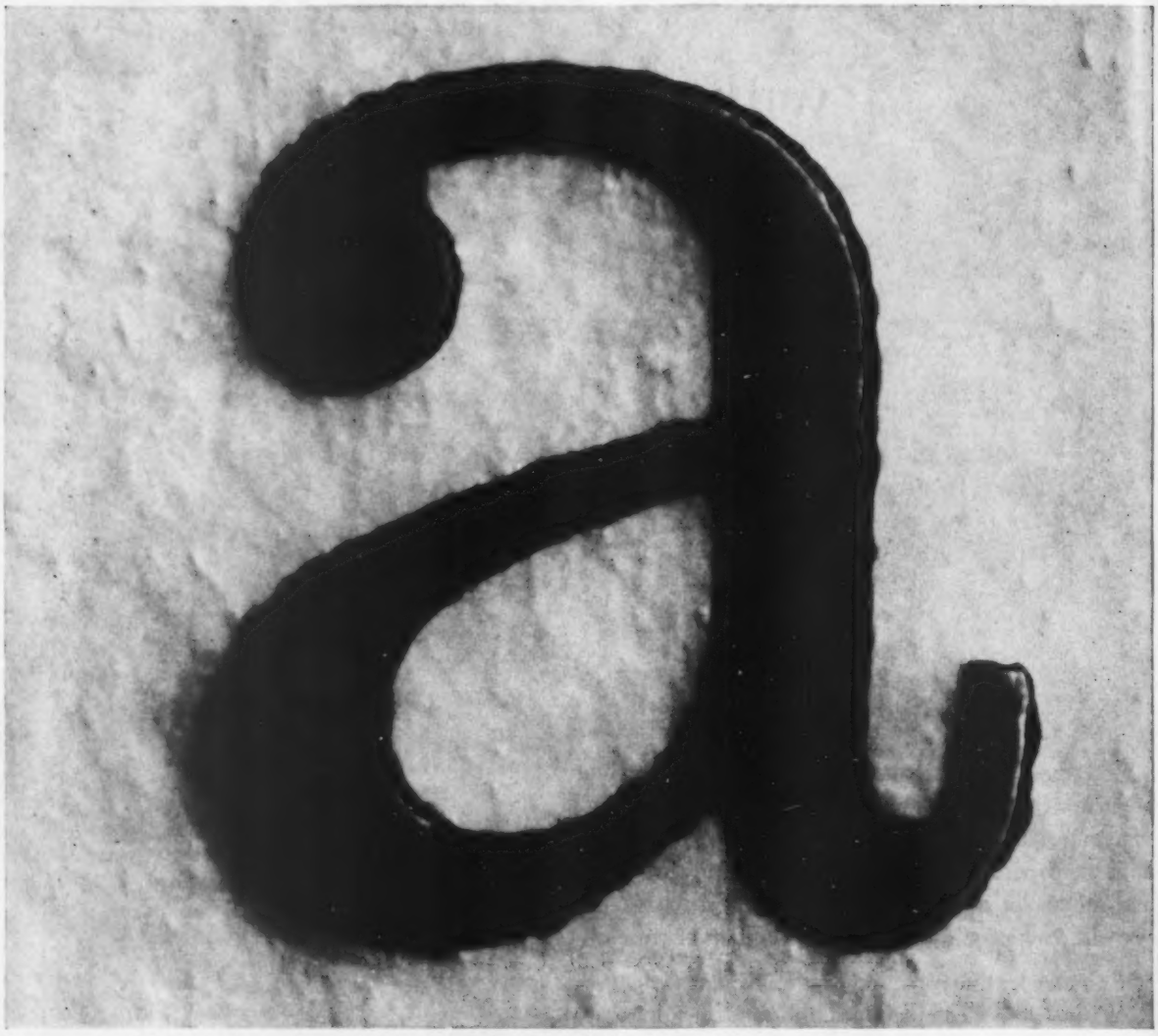
Penick & Ford

PENICK & FORD, LTD.

INCORPORATED
750 THIRD AVENUE, NEW YORK 17, N. Y.
1531 MARIETTA BLVD., ATLANTA, GA.
CEDAR RAPIDS, IOWA
18 CALIFORNIA ST., SAN FRANCISCO 11, CALIF.

For more data circle 110 on Post Card

DOW | LATEX



12-pt. Garamond type impression printed originally on paper coated with Dow Latex 630 and magnified approximately 85 times to show paper surface uniformity. The uniform impression and ink distribution greatly improve print quality.

Now . . . better control of paper uniformity with
NEW DOW LATEX 630

- **Excellent Mechanical Stability!**
- **Superior Pick Resistance!**
- **Excellent Starch Compatibility!**

Three good reasons why new DOW LATEX 630 can help you make . . . help you sell . . . better paper than ever! You'll find it far easier to produce uniform paper with smoother, more pick resistant coatings made from Dow Latex 630. Paper surfaces provide a new high in printability, reproducing both illustrations and type with remarkable sharpness and realism. Dow Latex 630 will give you the coating quality you usually associate with higher cost!

Contact Dow now for detailed information to help you make the most of new DOW LATEX 630! Write to THE DOW CHEMICAL COMPANY, Midland, Michigan. Coatings Sales Department 1934DN11.

See "The Dow Hour of Great Mysteries" on TV.

THE DOW CHEMICAL COMPANY • MIDLAND, MICHIGAN

For more data circle 111 on Post Card

Serving customers who buy NH_3 and Nitrogen Solutions . . .

All in a Day's work for George

George Day, that is. George is the man customers have come to depend upon for these reasons: (1) George is from Standard Oil, a supplier with 70 years' experience making products that meet specifications and delivering these products to customers *on time.* (2) The Standard Oil Anhydrous Ammonia and Nitrogen Solutions which George sells are produced in one of the industry's most modern plants located in one of the best railway and highway shipping centers in the U.S. (3) One of the Midwest's largest quality control laboratories insures the high quality and "on spec." character of these products.

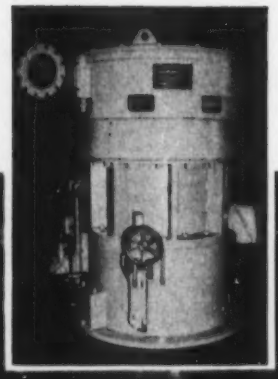
Customers also know George can be depended upon to look after their needs. Twenty-three years' experience serving customers for Standard Oil has taught him how to give these customers the kind of service that means profits *for them.*

Would you like help from George Day? Call him at **Standard Oil Company (Indiana), 910 South Michigan Avenue, Chicago 80, Illinois.**

You expect more from **STANDARD** *and you get it!*

For primary refining at low power...

New Jones Vertiflex



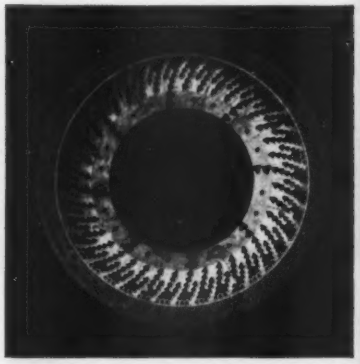
Vertiflex requires minimum floor space. Available in two disc sizes — 48" (shown here) and 34".

Typical application..... Chip Shredding

High quality pulp with extremely low waste and fibre damage, substantial savings in alkali used, increased yield, decreased screen rejects and lower recovery system loading — those are the results from this efficient Jones Vertiflex chip shredding installation. And energy required to process more than 2000 B.D. tons per day is just over ¼ HP days per ton!

Full size chips are fed to the Vertiflex by belt conveyors from two chip silos. Resulting "shreds" are as long as the original chips, but greatly reduced in cross section.

Other applications on which the Jones Vertiflex will perform with outstanding efficiency include cold caustic chips, high yield pulps, bagasse, high density bleaching and denoodling. For full details write to E. D. Jones Corporation, Pittsfield, Mass.



Teeth in vertically mounted rotating disc inter-mesh with teeth in opposing stationary plate mounted in Vertiflex cover. Clearance is easily adjustable and disc life is high since there is never any metal-to-metal contact. Teeth shape and arrangements are varied to fit the application.

E. D. JONES CORP. member BELOIT group PITTSFIELD, MASS.

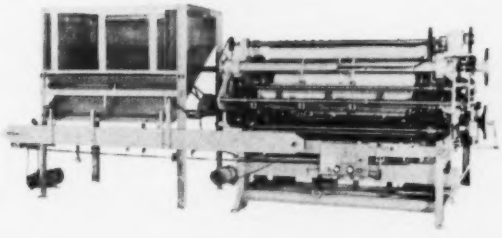
Jones

PULP MILL EQUIPMENT AND STOCK PREPARATION MACHINERY

Represented in Canada by
The Alexander Fleck Ltd.
75 Spencer Street, Ottawa

For more data circle 113 on Post Card

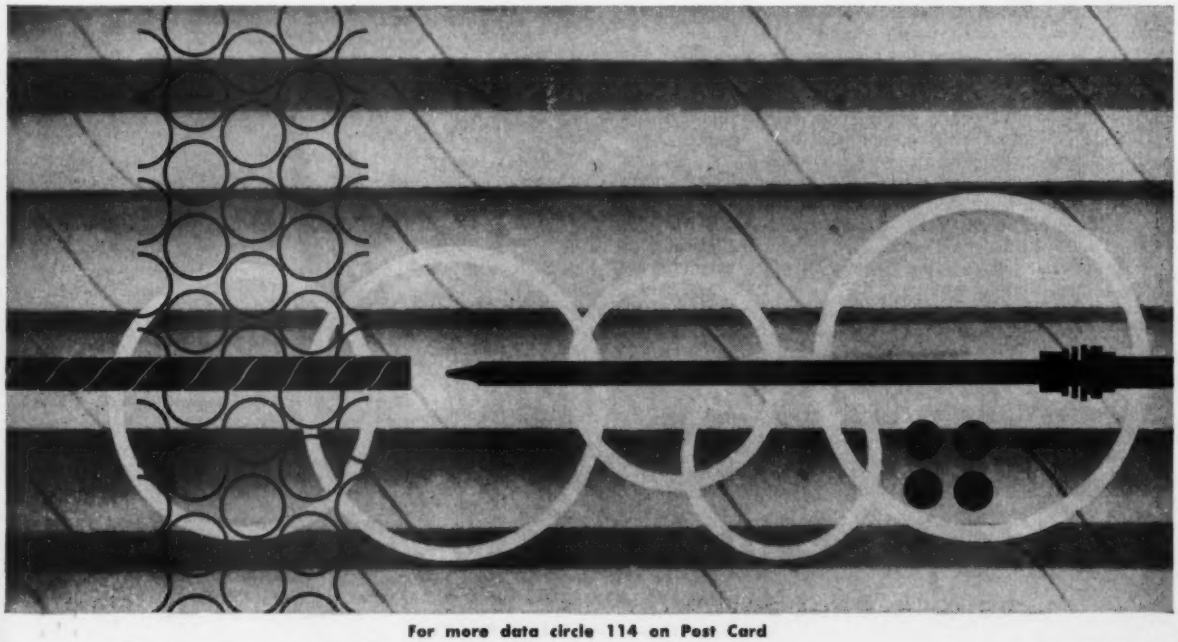
Creative engineering
and development
of converting machinery



New Automatic Core Loader — loads up to 15 long cores per minute! This new PCMCo loader, Model 2765, has a new system for feeding and positioning cores, using a simple conveyor and pushing action with no reciprocating mass. An exclusive roller system guides the mandrel into the incoming core for positive feed and positioning. Cull discharge and storage plus log storage facilities and slit roll discharge are other production-slanted design features. Just right for coordination with a Paper Converting automatic rewinder. One of the important new converting machines from the builder you should think of first.

PAPER CONVERTING MACHINE COMPANY - GREEN BAY, WISCONSIN

Folders, Rewinders, Embossers, Napkin and Core Machines, Letterpress and Flexographic Presses, Special Converting Machinery



For more data circle 114 on Post Card

GET **more** FOR YOUR **core** DOLLAR....

A Sonoco core specialist is nearby!

Core specialists are located at SONOCO plants from coast to coast to personally assist you. They represent a company that can meet your most demanding requirements for core strength, tolerance and economy. This is possible because SONOCO has 60 years' experience, completely integrated manufacturing facilities and a continuous research program.

SONOCO cores are made to exacting torque and crush strength specifications. Non-returnable cores are available in all sizes. Returnable cores, with or without famous SONOCO metal ends, are made in all standard sizes. SONOCO can also supply a complete line of metal end core machinery and core cutters.

Regardless of your core needs, you'll get more for your core dollar from SONOCO in service, quality and economy. Call or write today!

SONOCO

Paper Mill Cores

SONOCO PRODUCTS COMPANY

Main Office—Hartsville, S. C.

- Mystic, Conn.
- Akron, Ind.
- Lowell, Mass.
- Holyoke, Mass.
- Phillipsburg, N. J.
- Longview, Texas
- Philadelphia, Pa.
- La Puente, Cal.
- Fremont, Cal.
- Atlanta, Ga.
- Richmond, Va.
- Brantford, Ont.
- Granby, Quebec
- Mexico, D. F.

1102

For more data circle 115 on Post Card

. . . WITH EVERY SWENSON INSTALLATION!

You buy more than precisely fabricated metal whenever you invest in a Swenson Evaporator, Crystallizer, Dryer, Filter or Pulp Washer. You also purchase the close, personal interest of your Swenson engineer.

Swenson engineering integrity demands meticulous preliminary planning, insists on pre-installation testing and oversees every phase of installation. Your Swenson engineer makes post-installation checks, too, assuring the continuous control of processing and production that has made "Swenson" synonymous with profitable, trouble-free operation.

For experienced consultation—and accurate cost studies—you'll find a Swenson engineer at the other end of your phone.

SOMETHING YOU CAN USE!

Ask for Bulletin SW 205—*FORCED CIRCULATION EVAPORATORS*—eight-page treatise on salting and non-salting types, single and multiple effects. *Swenson Evaporator Company, 15653 Lathrop Ave., Harvey, Illinois. In Canada: Whiting Corporation (Canada) Ltd., 350 Alexander Street, Welland, Ontario, Canada.*

PROVED ENGINEERING FOR THE PROCESS INDUSTRIES SINCE 1889

SWENSON®

A Division of WHITING Corporation

WHITING-MANUFACTURERS OF CRANES; TRAMBEAM® HANDLING SYSTEMS; PRESSUREGRIP; TRACKMOBILES,® FOUNDRY, AND RAILROAD EQUIPMENT

For more data circle 116 on Post Card

Feature articles

Marathon Southern Corp.'s new board mill in operation

A. W. J. DYCK

Marathon Southern Corp.'s new board mill features a maximum of automation and many new and novel instrument control systems. The new Black-Clawson machine features the practical installation of the first Accra Nip roll-bending device on the finishing calender stack.

AMERICAN Can's Marathon Southern, Naheola, Ala., can justifiably look with pride upon its new board manufacturing facilities which make it one of the most highly instrumented and automated board mill in existence. This automated system includes: (1) a completely graphic stock blending system using magnetic flow meters; (2) a highly automatic board machine with each system and operation completely interlocked; (3) an automatic system of handling and preparation of additives and dyes; and (4) a completely automatic high density broke tower system.

The modern 236-in. wide board machine, which had a completely trouble-free start-up, incorporates the following major features: (1) a Hydro-Flow 240 pressure headbox equipped with single control for level and total effective head held within 0.1 in.; (2) five presses including two suction presses, one conventional plain press, one crownless hot press and a smoothing press; (3) four Gardner air dryers on the first dryer section; (4) a horizontal size press; (5) two open-type calender stacks separated by two dryers, the second calender being equipped with an Accra Nip roll bending device for instantaneous crown control; (6) three on-the-machine trailing blade coaters and air dryers; (7) a belt broke conveyor under the dry end; and (8) a broke pulper with a specially designed extended rotor.

Rust Engineering Co. was retained as the engineering contractor and constructor for the new mill.

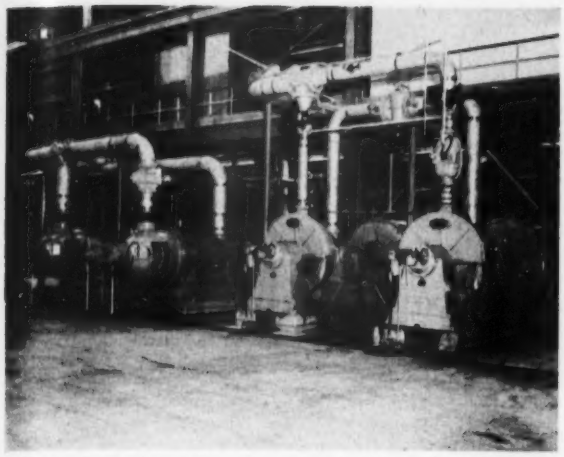
Stock preparation and proportioning

The stock used in the manufacture of board at Marathon is a mixture of broke, baled pulp, in addition to pine and hardwood pulp from the Naheola pulp mill.

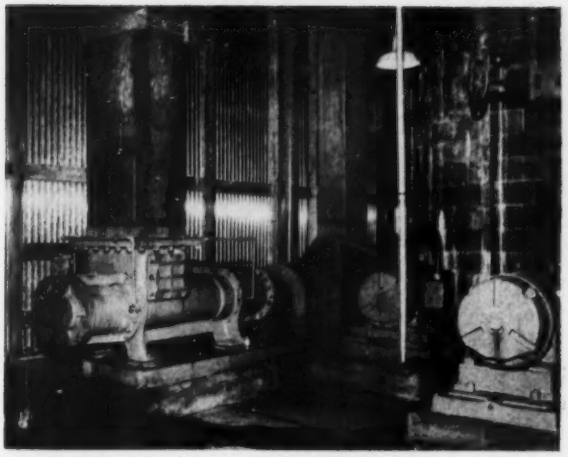
Broke is pumped from the high density broke tower through a consistency regulator into a broke chest. From here it goes through a consistency regulator and breaker trap and is proportioned by a magnetic flow meter into the machine chest.

Baled pulp is pulped in a large Pulpmaster pulper and stored in a pulp stock chest. It is then pumped through a consistency regulator and metered by a magnetic flow meter, through three Emerson 303 Claflins connected in parallel, into the proportioning chest. The Claflins are driven by 400 hp motors.

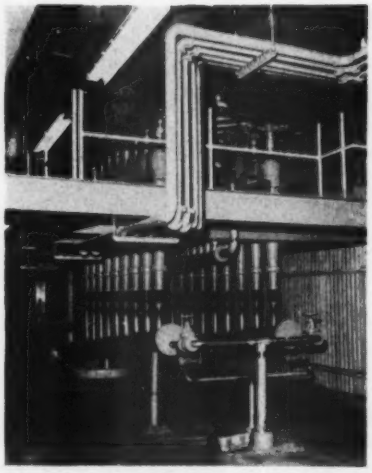
Pine and hardwood pulps from the high density pulp towers are passed, as required, through consistency regulators and stored in either the pine or the hardwood storage chests. From



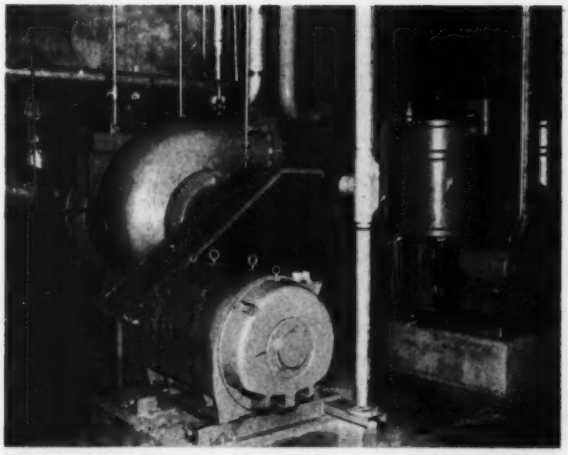
Left are E. D. Jones Corp. Leviathan jordans and, right, J. W. Bolton Model 303 Emerson Claflins.



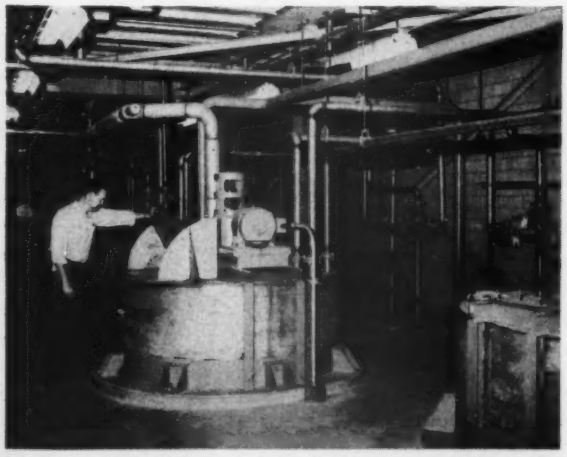
Warren Pumps, Inc. No. 11 high density stock pump is used on the broke system.



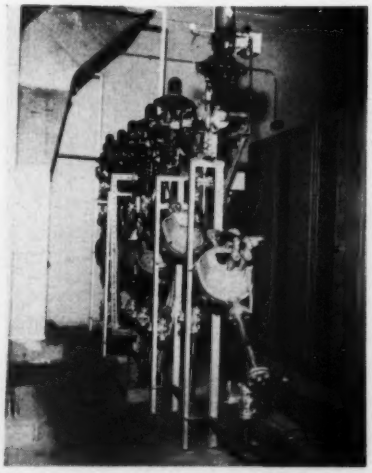
Bauer Bros. No. 623-4, 650 gpm capacity Centri-cleaners featuring vacuum rejects system.



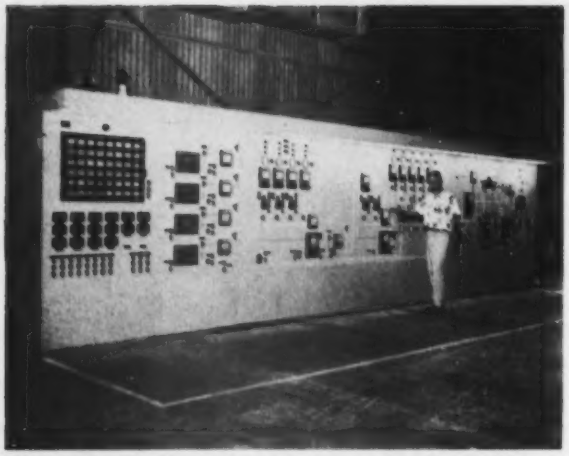
Allis-Chalmers 13,500 gpm ACAP fan pump and Black-Clawson Model-24 selectifier screens.



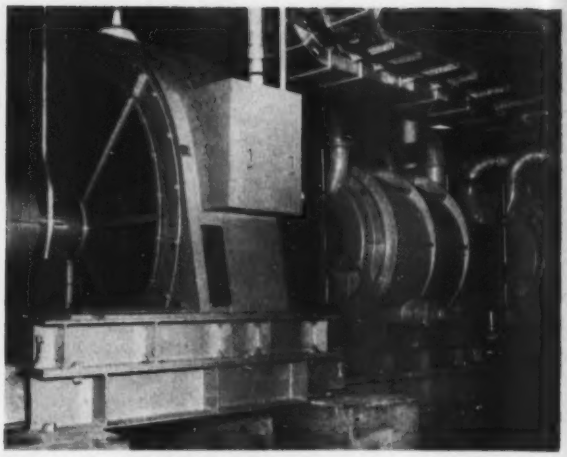
Bill Farin, pulp and paper engineer, views operation of TiO_2 mixing tank supplied by Bristol Metals Products Corp.



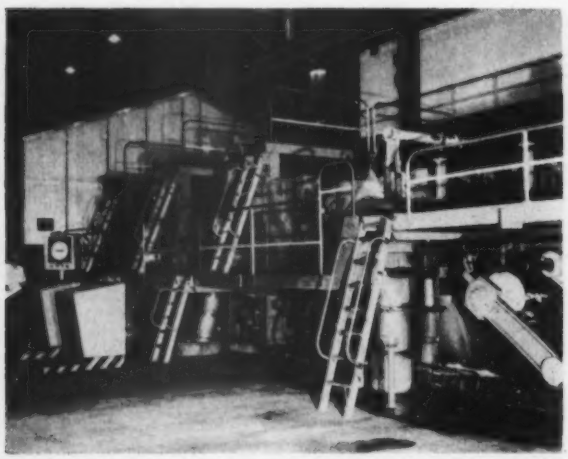
A series of Foxboro magnetic meters each of which meters its own additive to the paper furnish ahead of the machine.



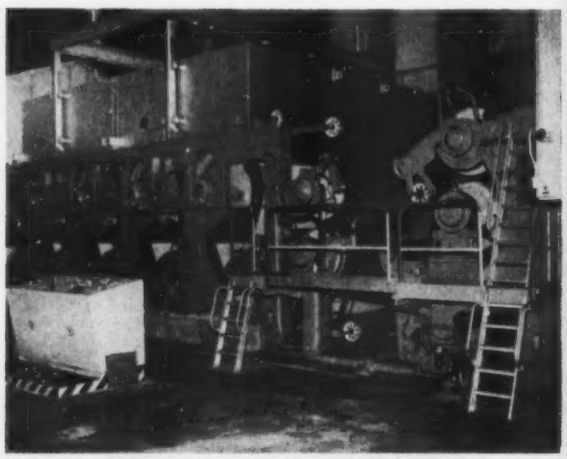
Richard Fricton, supervisor of instrument control, in front of Foxboro graphic panel which controls all stock preparation.



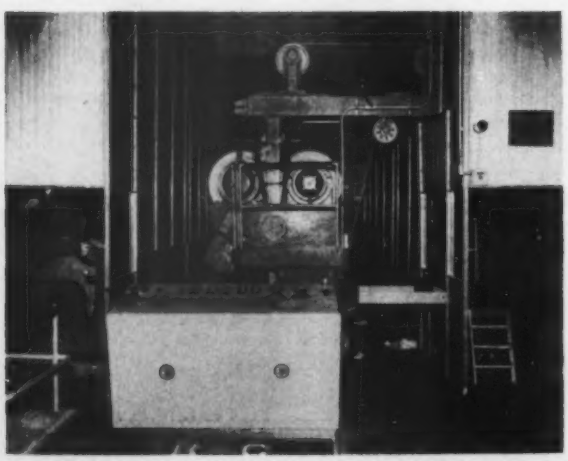
Nash Engineering H5308A Hytor vacuum pumps, driven by a single 1500 hp motor, supply all vacuum requirements of the machine.



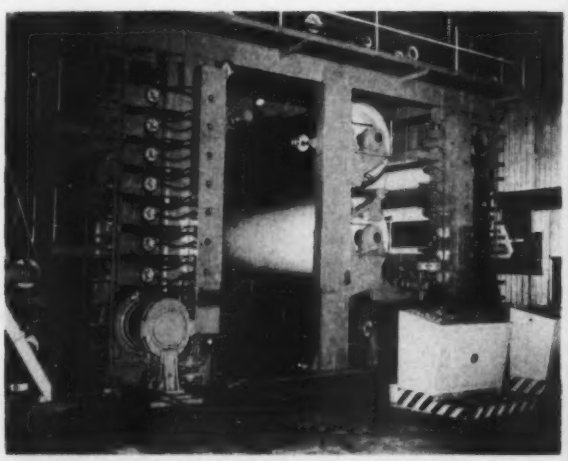
Seen is part of wire, couch, presses and first dryer section of the Black-Clawson machine with Ben Gunther, board mill superintendent, at the controls.



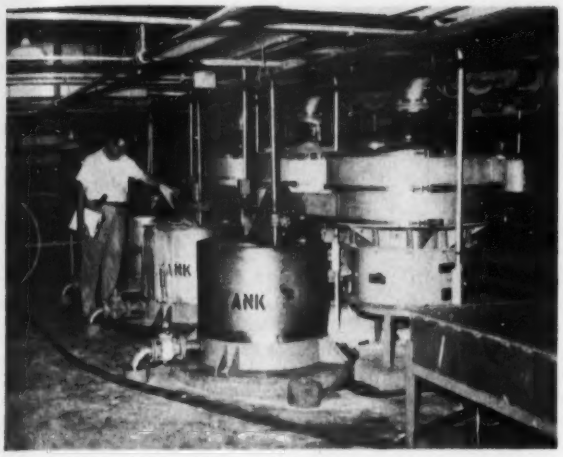
Black-Clawson crownless hot press and dryer section aided by four Gardner dryers. The latter are gas heated.



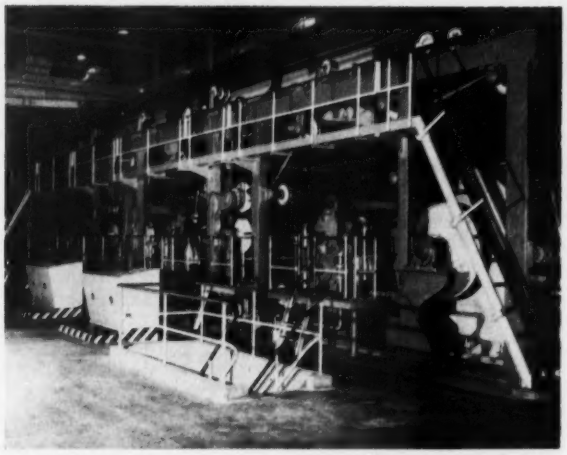
View of the Black-Clawson horizontal size press which is located between the 3rd and 4th dryer sections.



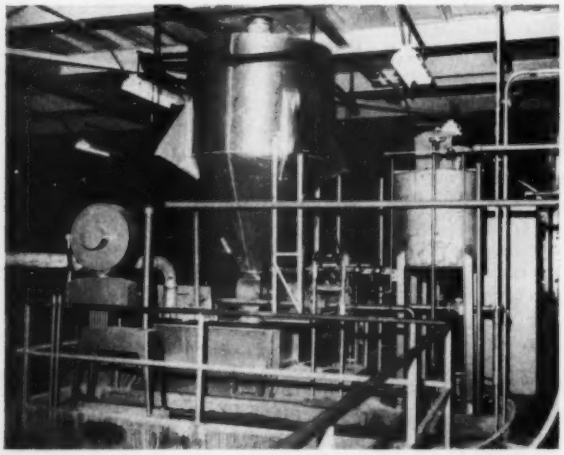
Black-Clawson calender stacks. The finishing calender stack is equipped with the unique Accra-Nip roll bending device.



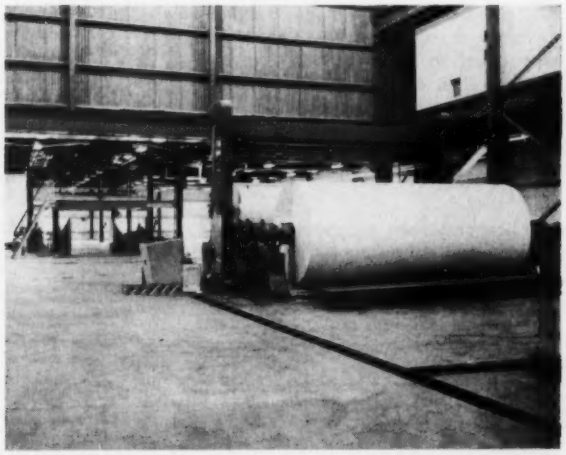
Ben Gunther, board mill superintendent, examines operation in stainless steel bulk carts which are part of the coating system. Also seen are South Western stainless Sweco screens.



Rice Barton trailing blade coating system features three Overly's Inc. Gardner air dryers. The latter are equipped with steam coils and pneumatic air cylinders.



Coating ingredients are mixed in batches in a Read Standard Sigma coating mixer.



View of Black-Clawson Model 200 slitter-winder and Lamb-Grays Harbor roll finishing system.

here they are pumped through separate lines, consistency regulators, and magnetic flow meters to the three-unit Claflin system and the proportioning chest.

The proportioned stock is then pumped through a consistency regulator and two magnetic flow meters in parallel to the Claflin 303 refiners. All Claflins are equipped with special plug positioning mechanisms.

Among other new features incorporated in the new Model 303 Claflins are: (1) oil mist lubrication; (2) visual oil level indicator with audio alarm; (3) high pressure unit rated at 100 psi; (4) discharge flange cast integral, eliminating pipe removal when opening machine; (5) special inspection plates added; (6) plug and shaft are removable without dismantling the bearings and packing box; and (7) all inspection openings and controls are accessible from one side of the machine.

Following the Claflins, stock is pumped through a premix chest where stock additives are added through a series of magnetic flow meters. From here, stock passes to the machine chest.

It is pumped from the machine chest through a consistency regulator to two Leviathan jordans driven by 700 hp motors. The jordans are equipped with Accru-Set automatic control, Adapta Plug and No Wave filling. A special feature of the jordans is the Dynamic Plug balancing at operating speeds.

Jordaned stock passes through a stuff box and is then pumped to the No. 623-4, 650 gpm Centricleaner consisting of 18 primaries, 3 secondaries, and one tertiary. Both the primary and secondary stages employ a vacuum rejects system which operates at 22 in. Hg. The vacuum rejects system was selected over eductors since it is non-plugging and therefore requires little maintenance and is more effective in removing air. Accepted stock from the Centri-cleaners is pumped by a 13,500 gpm ACAP fan pump through six 24-P selectifier screens to the machine headbox.

Stock blending, refining and preparation is completely automatic, the operation being controlled from the graphic stock preparation panel. Each major variable in the operation is recorded and all blending percentages are set directly on the panel. The percentages are maintained irrespective of variations in the machine demand. All flow measurements are by magnetic flow meters and all flows are totalized on the panel.

The board machine

The board machine, operating at 150-1000 fpm, is designed to produce 65-375 lb. paperboard.

The machine has a Hydro-Flow 240 pressure headbox in which level and effective head are held within 0.1 in. by a single Marathon Corp., designed control system.

The fourdrinier, a Hydroflyte cantilever type, features four Vibro-Flyte shake units, a 30-in. dia. breast roll which is frame-mounted for full cantilevering, 29 rubber-covered table rolls, 12 suction boxes, a 20-in. dia. Dandy roll, a 44-in. dia. suction couch roll, and horizontal pneumatic wire guide.

The press section consists of: (1) a first straight-through suction press with a 40½-in. dia. suction bottom roll and a 35-in. dia. plain top roll; (2) a second straight-through suction press identical with the first; (3) a third straight-through plain press with a 36-in. dia. bottom roll and a 35-in. dia. top roll; (4) a fourth plain hot press with a 36-in. dia. bottom and a 36-in. dia. top crownless rolls; and (5) a plain smoothing press with 34-in. dia. top and bottom roll.

The press felts are equipped with Vickery felt conditioners of the latest design. They are equipped with traveling headers, vacuum boxes adjustable for trim of felt, and control panel for quick and convenient adjustment to the speed of the felt.

Vacuum in the suction boxes, couch, and suction presses is provided by a system of five Hytor H5308A vacuum pumps driven by a single 1500 hp motor.

A predryer section, consisting of six 5-ft. dia. paper dryers and a 5-ft. dia. felt dryer, is located between the third press and the hot press.

Following the smoothing press is the first dryer section consisting of ten 5-ft. dia. paper dryers supplemented by four gas-heated Gardner dryers.

The second dryer section consists of twelve paper dryers and one felt dryer, the third section of 14 paper dryers and one felt dryer, and the fourth section of 12 paper dryers — all are 5 ft. dia. and 234 in. face. A horizontal size press is located between the 3rd and the 4th dryer sections.

Following the 4th dryer section are the two, open-type, 8-roll calender stacks separated by two intermediate dryer rolls of 5 ft. dia. The finishing calender stack features the unique Accra Nip roll bending device for effective and instantaneous crown control.

Three on-the-machine trailing blade coaters follow the calender stacks. Each coater is followed by one or two conventional 5-ft. dia. dryers and a steam-heated Gardner dryer.

The Autoflyte reel features a 42-in. dia. drum and is capable of winding 96-in. dia. paper rolls.

A 3000 fpm Rollflyte slitter-winder is equipped with two 22-in. dia. drums and winds rolls of 84 in. dia. and 216 in. trim width. It is driven by two 200 hp dc motors equipped with speed reducers. The unwind stand is equipped with two air operated, water cooled brake units in tandem.

A belt conveyor under the dry end of the machine collects and conveys all broke to the Pulpmaster pulper equipped with a specially designed extended rotor to match the size of the machine. The pulper is also equipped with fixed impellers at each end of the rotor. The pulper handles all broke slab and winder trim continuously.

Board machine drives

The board machine drive consists of a steam turbine, lineshaft, and 18 take-offs consisting of cone pulleys and spiral bevel gear units. The cone pulleys are connected with the lineshaft by Extremultus belts.

The 18 take-offs are located at: (1) the fourdrinier wire drive roll; (2) one each on the first, second and third presses; (3) the pre-dryer section; (4) the hot press; (5) the smoothing press; (6) one on each of the first, second and third dryer sections; (7) the size press; (8) the fourth dryer section; (9) the first calender stack; (10) the second calender stack with right angle secondary take-off to drive the intermediate dryer rolls; (11) one on each of the first, second and third coaters; and (12) the reel drive.

Additional helper drives are located as follows: (1) three 50 hp dc motors on the wire return rolls; (2) a 150 hp motor on the suction couch roll; (3) a 25 hp dc motor on the first roll of the horizontal size press; (4) a 25 hp dc motor on the first coater dryer roll; (5) a 25 hp dc motor on the first draw press in the coater section; (6) a 25 hp dc motor on the second coater dryer; (7) a 25 hp dc motor on the second draw press; (8) a 25 hp dc motor on the third coater dryer; and (9) a 25 hp dc motor on the third draw press.

Basis weight control

An AccuRay basis weight control system — consisting of a measuring unit, operator station, basis weight recorder, and a controller which automatically controls the stock flow — is used to produce a uniformly thick board.

The measuring unit — consisting of a radioactive source, detector and electronic components — is located immediately before the size press. The entire assembly — which retracts off the sheet during sheet breaks, is mounted on a rigid frame and is designed to scan across the sheet on four adjustable tubes.

The X-Y recorder records a horizontal profile of the basis weight variations as the measuring unit scans across the sheet. Another records (1) the average of the sheet basis weight after each scan; (2) a vertical profile with average presentation; and (3) a trace of the machine direction variations.

Heating and dryer drainage system

The heating and dryer drainage system was designed by Marathon Corp. engineers. It operates on a cascade principle with 50 psi steam supplied to the predryers, and the size press dryer sections and 150 psi steam to the other dryer sections.

An unusual feature of the dryer drainage system is the cooling tower supplying the vacuum condenser with 1000 gpm of cold water. All condensed water is pumped to a central condensate storage tank.

Broke and white water system

Pulped broke is pumped from the dry end pulper through a consistency regulator to the couch pit which also receives the overflow from the wire pit as well as wet-end broke. It is then pumped through a Kalle consistency regulator which adjusts its consistency by adding automatically dilution water or sweetening stock. From the consistency regulator it goes directly to a 12-ft. dia. by 20-ft. long, drum-type, valveless saveall, the largest of its kind in operation.

Filtrate from the saveall is collected in a clarified water chest and is used for all stock dilution, and consistency regulation.

Pulp from the shredder conveyor of the saveall is pumped at 10 per cent consistency by a No. 11 High-Density, 915 gpm stock pump into the 100-ton capacity high density broke tower. The high-density stock pump, a relatively new development for handling high density stock, is made of cast iron and is stainless steel fitted. It has chrome plated pump body bores, large rectangular

Principal equipment installed at Marathon Southern board mill

Engineering and Construction Contractor: Rust Engineering Co.

Stock preparation and proportioning

Broke tower, 100-ton capacity, equipped with agitator, and circulating loop system ..... Improved Machinery Inc.
Centri-Cleaners (22), No. 623-4, 650 gpm capacity each, 18 primaries, 3 secondaries, and 1 tertiary ..... Bauer Bros. Co.
Claflins (9), Emerson, Model 303, with special plug positioning mechanisms, driven by 400-hp motors ..... John W. Bolton & Sons Inc.
Consistency regulators ..... DeZurik Corp.
Fischer & Porter Co.
Fan Pump, 13,500-gpm ACAP ..... Allis-Chalmers Mfg. Co.
Instrumentation, graphic panel and instruments ..... Foxboro Co.
Jordans (2), Leviathan, with Accru-Set automatic control ..... E. D. Jones Corp.
Magnetic flow meters ..... Foxboro Co.
Motors ..... Allis-Chalmers Mfg. Co.
Pumps ..... Allis-Chalmers Mfg. Co.
Selectifier screens, Model 24-P ..... Black-Clawson Co.
Stock pump, high-density No. 11, used on broke system ..... Warren Pumps Inc.

Board machine

Air system, air-curtain hood and ventilation system ..... Jamar Olmen Co.
Basis weight control system, Accu Ray, consisting of measuring unit, x-y recorder, and controller ..... Industrial Nucleonics Corp.
Breaker trap ..... Black-Clawson Co.
Broke conveyor, belt-type ..... Black-Clawson Co.
Calender stacks (2), open-type 8-roll calenders, one equipped with Accra-Nip roll bending device; stacks separated by 5-ft.-dia. dryer cylinders ..... Black-Clawson Co.
Coaters (3), trailing-blade type ..... Rice Barton Corp.
Cranes (2), 30-ton capacity each ..... Northern Engineering Works
Doctors ..... Lodding Engineering Corp.
Dryer drainage system, cascade-type, special Marathon design with cooling tower and vacuum condenser ..... Marathon Corp.
Dryer section, 58 paper dryers and 2 felt dryers, all 5-ft.-dia. and 234-in. face ..... Black-Clawson Co.
Dryers (7), Gardner, four on wet end and three on coaters; four are gas-heated and three steam-heated ..... Overly's Inc.
Drive system, consisting of lineshaft, cone pulleys and spiral-bevel gear units ..... Black-Clawson Co.
Electrical starting equipment ..... General Electric Co.
Felt conditioners, Vickery, equipped with traveling headers, adjustable vacuum boxes, and central control panel ..... Bird Machine Co.
Fourdrinier, Hydroflyte cantilever type, 236-in.-wide wire, 29 table rolls, 12 suction boxes, 44-in.-dia. suction couch, etc. ..... Black-Clawson Co.
Headbox, Hydro-Flow 240, pressure-type ..... Black-Clawson Co.
Instrumentation, wet and dry end graphic panels and instruments, etc. ..... Foxboro Co.
Motors, electric ..... Allis-Chalmers Mfg. Co.
Pipe and fittings, stainless steel ..... Bristol Metal Products Corp.
Pre-dryer section, six 5-ft.-dia. dryers and a 5-ft.-dia. felt dryer ..... Black-Clawson Co.
Presses (5), 1st suction, 2nd suction, 3rd plain, 4th hot press, and 5th smoothing press ..... Black-Clawson Co.
Pulp Master pulper, with specially designed rotor, fixed impellers ..... E. D. Jones Corp.
Roll finishing system, consisting of shuttle track, roll grouper, wrapping roll units, wrapper backstand, automatic head gluer, and heading machine ..... Lamb-Grays Harbor Co. Inc.
Reel, Autoflyte, with 42-in.-dia. drum ..... Black-Clawson Co.
Saveall, 12-ft.-dia., drum-type, valveless ..... Dorr-Oliver Inc.
Screens (9), Sweco, 48-in.-dia., stainless steel, with 100-mesh screen cloth ..... Southwestern Engineering Co.
Slitter winder, Model 200, Rollflyte, 3000-fpm, with two 22-in.-dia. drums, driven by two 200-hp Reliance motors through speed reducers .. Black-Clawson Co.
Stainless steel tanks, mixing and circulating, for additive system ..... Bristol Metal Products Corp.
Turbine, steam, on paper machine drive system ..... Westinghouse Electric Corp.
Vacuum pumps (5), Hytor H5308A, driven by 1,500-hp motor ..... Nash Engineering Co.

Additives system

Agitators, in mixers and starch cookers .... Mixing Equipment Co. Inc.
Bulk handling system, automatic, consisting of screw conveyor, star valve, pneumatic conveyor, and storage tanks ..... The Fluidizer Co., Division of Daffin Corp.
Coating mixer, Sigma ..... Read Standard Div., Capitol Products Corp.
Eductors ..... Schutte & Koerting Co.
Heaters, steam-jet type ..... Schutte & Koerting Co.
Instrumentation, additives and coating preparation control systems ..... Foxboro Co.
Magnetic flow meters ..... Foxboro Co.
Mixing and holdup tanks, stainless steel .. Bristol Metal Products Corp.
Pumps, Equi-seal type, equipped with centrifugal seals ..... Allis-Chalmers Mfg. Co.
Saran pipe ..... Dow Chemical Co.
Syphons, steam-jet type ..... Schutte & Koerting Co.

suction openings and features a pair of intermeshing screws with timed driving gears designed to eliminate metallic contact between the pumping screws and the pump body bores. The screw pump design eliminates the need for auxiliary feeding and allows stock to be pumped with a minimum of working and without pulsation.

The high-density, 100-ton capacity broke tower operates completely automatically. The moment the 4 per cent broke chest level goes down to a preset level, it automatically activates the whole high-density tower system, involving the mining and circulation water, circulator, consistency regulator and flow controllers.

Gardner dryers

The installation of four Gardner dryers enabled Marathon to eliminate 12 dryer cylinders from the original paper machine design, reduce the operating floor area by 3000 sq. ft., and shorten the machine air-curtain hood.

The four wet-end dryers, each of which shrouds two paper cylinders, are equipped with air circulating fans driven by 200 hp motors. The air system consists of dryer hoods, air heating chambers, ductwork, filters, supply and exhaust fans, retracting systems, and the necessary controls.

The heat source of each wet-end dryer is a direct fired 15,000,000 BTU/hr gas burner which heats the mixture of recirculated and fresh air in the heat chamber to a temperature of approximately 550° F.

From the heat chamber, air enters the circulating fan and is delivered to the plenum inside the dryer hood. From the plenum, air passes through contoured orifice inlets and is discharged from slot type nozzle orifices at speeds in excess of 15,000 fpm. The nozzles are spaced at 1-in. intervals and are positioned ¼-in. from the web. At this distance, the film boundary layer formed by moisture is broken down by the air velocity, thereby increasing the thermal conductivity and mass heat transfer of the boundary film. The air then flows to the edges of the nozzle section and is returned to the heating chamber, where a predetermined quantity of moisture-laden air is discharged through the exhaust fan while an equal volume of fresh air is admitted to the system through a fresh air intake.

The dryers can be advanced or retracted hydraulically to or from the paper cylinders. Dryer control panels are designed for manual or automatic operation.

The three Gardner dryers on the

coaters operate on the same principle with the exception that, due to a reduced heat demand, steam coils instead of gas burners are used to heat the air. Other differences exist in the mode of retracting and advancing the dryers from and to the paper cylinders. Retraction operates on a roll-away system while pneumatic air cylinders are used to advance the dryers to the paper cylinders.

Roll-finishing system

The custom-engineered roll-finishing system includes (1) a 60 ft. shuttle track equipped with two 36-in. shuttle carts at floor level on which rolls are transported to temporary storage or to the wrapping and heading line; (2) a roll grouper featuring a tilting roll case which discharges grouped rolls to the wrapping-roll system; (3) the wrapping-roll system, equipped with a pneumatically controlled retractable ejector, rotates the paper rolls while the desired number of wraps are applied; (4) a wrapper backstand, crane and dispenser which hold five rolls of wrapping paper of different widths for the operator's selection; (5) an automatic head gluer equipped with rotating table that can accommodate rolls up to 72 inches in dia.; and (6) a 72-in. heading machine equipped with heating platens and a vacuum device for holding the outside heads.

The heading machine is hydraulically actuated from a pushbutton control station to squeeze the crimp and set the glue. Upon disengagement of the press platens, the completely finished roll is discharged automatically by the tilting roll case method.

Additives system

A fully automatic centralized additives and coating preparations system, located in a separate building, is solving many of Marathon's problems connected with unloading, warehousing, trucking, handling, bag dumping and mixing of additives and coating materials. The automated procedures are set up and controlled through the use of graphic panels.

Dry chemicals are purchased in bulk, to obtain substantial cost savings, and are handled in a single unloading system. The unloading system consists of a screw conveyor feeding bulk material through a star valve into an air stream which conveys it to any of the five 4,500 cu. ft. capacity epoxy-lined, steel constructed storage silos. Two of the silos are used for storing starch, one for calcium carbonate, and two for clay.

Most additives are batch-prepared in agitated stainless steel tanks and stored in holdup tanks. All additive slurries are pumped with centrifugal "equi-seal" pumps equipped with centrifugal seals, so that no shaft leakage occurs during pumping.

All additives, with the exception of rosin size, are continuously circulated to the machine through separate loop systems, from which take-offs to the machine are proportioned as needed through magnetic flow meters, control valves, and short self-draining lines. Thus eleven different additives are proportioned to the total flow of stock and broke by eleven separate magnetic flow meters, each maintaining the supply of its additive at the set rate of parts per thousands. The additions include alum, starch, calcium carbonate, titanium dioxide, Dyes No. 1 and No. 2, pitch dispersant, defoamer, rosin, etc.

The return line of the circulating loop to the holdup tank is sometimes smaller or throttled with a "V" port valve to provide the sufficient pressure at the take-off points. The return slurries as well as those from the mixing tank are screened through easily removable screens on entering the holdup tank.

The circulating loop of the alum system is made of Saran pipe.

Coating mixtures

Coating ingredients, are mixed in batches in a Sigma coating mixer and transported in bulk carts to the coaters where they are connected and become part of the all stainless steel trailing blade coater system.

Each of the three trailing blade systems consists of a bulk cart, three 48-in. dia. Sweco screens equipped with 100 mesh stainless steel screen cloths and two Moyno pumps.

Instrumentation and control

Because of the centralization and strategic location of the instrumentation an impression is given that the machine is highly instrumented. There are no field mounted controllers and all supplemental controls for material handling at the size press, wet stack, and the three coaters are combined and designed into the machine consoles normally used specifically for machine operating controls only. This arrangement brings all controls and instrumentation into the operating aisle and decreases the number of control centers.

The control panels utilize the smaller graphic type of instrumentation and are arranged and presented in graphic fashion. Control panel area is approximately the same as if conventional big case instruments were used.

Total installed cost of the control instrumentation was 4½ per cent of the total project cost. This cost figure being below the average of similar projects within the paper industry, though the total instrument hardware cost itself was greater, the method of centralization and designing into related machine consoles reduced the installation costs so that the overall figure of 4½ per cent is less than previous like projects.

The instrumentation is divided in the following major control centers:

Board Mill Area. The control system here consists of the following panels:

(1) The stock preparation panel contains the controls for automatic proportioning, consistency control, prerefining and refining and additive additions. Also controls for automatic broke recovery.

(2) The wet end panel for control of the wet end operation from final jordoning to cleaning and screening.

(3) The dry end panel to control the Dryer drainage system, cooling tower, Hydraulic and lubricating systems with measurement of all utilities, i.e. gas, steam, air and water.

(4) The dry end broke pulper control panel for control of the dry end pulper, conveyor and consistence.

(5) All of the individual machine consoles.

Additive area. The additives and coating make-up control systems consist of:

(1) The size press coating make-up panel houses instruments for automatic weighing, mixing and preparation of internal starch, titanium dioxide and size coating. Level and temperature controllers heat and dump the additives and coating according to predetermined schedule.

(2) The rosin size and alum control panel automatically brings the tanks to the required level, adds water and heats the solution to the proper temperature.

(3) The trailing blade coating panel contains level instruments, consistency control, latex and stabilizer mixing controls, water blending, and storage of coating mixture controls.

(4) The miscellaneous make-up panel contains all controls for make-up of stabilizers, lime, pitch dispersant, defoamer, calender coating and wet strength, etc.

Selection of valves in the pulp and paper mill

LEO WALTER
Consulting Engineer

The in-service test of all sizes and types of valves under actual operating conditions is the only sure method of selecting the best of the many types and makes available.

SELECTION of valves solely on pressure and temperature considerations is usually not good enough in practice. There is much more to the problem than picking a valve-type from a catalogue and selecting a valve serial number from a Table, based on an assumed pressure and fluid temperature standard. Thinking of a valve as a variable restriction of flow in a piping system, it will be clear that the pressure differential between inflow and outflow can greatly vary during actual operation. The rate of flow is directly proportional, all other factors being equal, to the square root of this pressure differential. In practice, each type of valve has, however, a definite characteristic as regards flow, and these considerations may suggest that no two valves can possibly be alike in any plant. On the other hand, it is most desirable to standardize as far as possible; the fewest types and sizes should be used in groups to perform similar services as the most economical proposition.

For new piping systems the type of valve to be used depends, among other factors, on the frequency of usage, on the allowable fluid speed, and on the general kind of duty. A shut-off valve performs a different job from a throttling valve. To control rate of flow by a valve properly it is essential to know its characteristics; the latter must match the requirements of the job, otherwise trouble in one form or another can be expected.

Special care is required if an existing piping system has to work under altered circumstances, different from those prevalent when the piping was first installed. Bad choice in alterations can affect overall economy. It is not always desirable to order the same type of valve as a replacement; a better type may have become available having improved valve characteristics and easier maintenance features.

The correct choice of valve size and design is more than a matter of paper work. Standard rules or formulae cannot always be relied on. The in-service test of all sizes and types of valves under actual operational conditions is the only sure method to discover the best of the many types and makes available. Testing for ultimate selection can consist of temporary or permanent insertion of particular valves in existing lines. Where such test valves can withstand the factors of corrosion, pressure, temperature and contamination, and can be obtained at reasonable prices, the solution of the problem of valve selection should not, however, be difficult. Economy is, of course, a very important factor, but the over-riding consideration must always be reliability, ease of operation and maintenance, and probable economic life.

Sometimes it may be more economical to select a valve design which will not be as wear-resistant as others but which costs less, particularly when working conditions are so adverse that valves must be replaced frequently. In most instances, however, the best design and material will be that which is just good enough to withstand deterioration. For example, where all-steel valves corrode in service, trimming of seat and valve disc, or wedge, may be the best solution. In many instances the steel casing may corrode slightly, but the valve will still close tight. Valve manufacturers provide a great selection of trimmed valves and will advise on their use. In recent years gate valves have been greatly improved in design to perform a better job than older models of this type. The foundries of valve manufacturers are able, of course, to produce specially designed valves for unusual jobs.

Gate valves

Many valves are used for starting and stopping flow, having an on/off action. Gate valves are, of course, well suited for this intermittent service. Their seating design allows unrestricted flow in a straight line when fully open, and the pressure drop across them is low. Gate valves are, however, not best suited for throttling purposes, although for large diameters they sometimes have to be used. For flow regulation by means of throttling the specially designed globe valve is best. In general, gate valves should be selected for infrequent on/off operation only. Quick-opening designs are preferable where no danger of shock or water-hammer can occur.

The solid wedge-shaped disc is most commonly used in gate-valve design. Double-disc designs make closure by the wedge descending between two parallel or tapered seats in the valve body. For most satisfactory operation many makers recommend double-disc gate valves to be installed with the stem vertical and the hand-wheel upwards. Rising-stem types, where the stem-screw remains outside the valve body, have the advantage that the stem threads are not subjected to the effects of the fluids in the pipeline. The rising stem also shows at a glance

from a distance the position of the valve. A disadvantage can be that adequate headroom has to be provided for the rising stem when the valve is opened, in which case the stem may need protection in some instances. In the non-rising-stem type the fluid remains inside the bonnet when the disc or gate is raised, and this is the type for use where head-room is limited. Another advantage of a non-rising stem is that the wear on packing material is reduced, because the stem only turns when operated, and has no axial movement giving cause for friction. So-called quick-opening valves have their stem attached to a long hand-lever, but can only be used to a medium diameter when operated by hand. The bolted-joint is most widely used, but for very frequent inspection and cleaning of pipelines the clamp-type bonnet is recommended although not often found in practice.

Globe valves

Globe valves are well suited for applications where flow regulation takes place by throttling the flow area within the valve body. For severe throttling duties specially shaped valve discs have to be used. A globe valve has also a much shorter valve-stem travel than an equivalent gate valve. This requires less time of operation.

Good functioning of globe valves depends on their contacting faces. The latter fail if they become scored or eroded by the fluid. For example, with the higher steam pressures, wire-drawing can develop with globe valves having bevelled seats, particularly if the valve has to perform a throttling duty but is oversized, thus working for long periods of time in a nearly closed position. A wrongly selected steam-valve size can cause excessive wear and tear of the valve seat and disc. The general ruling should be that the actual working position of a throttling-steam globe valve must be somewhere in the middle of the total possible valve lift; this may mean that oversized valves must be exchanged for smaller ones for certain throttling duties. On the other hand, it may be advisable to exchange too small valves for shut-off duties for those having larger seat areas and less resistance to flow, especially if excessive steam-pressure loss coupled with wear and tear occurs. For valves handling liquids, the impingement of high-velocity fluids carrying abrasive solid particles is of course inimical to the lifetime of seats and valve discs. The desirability of pipeline strainers in front of important steam valves for this type of duty cannot be overemphasised, in spite of their additional first cost. Nothing is easier than to blow out a pipeline strainer periodically, or to take out its screen and clean it at weekends or after working hours. Pipeline strainers can thus save an enormous amount of valve maintenance work, and will repay their first installation cost tenfold in the long run.

A study of makers' literature will usually reveal the metal alloys required for specific valve applications. Seatings of the better-quality valves are manufactured of hard and durable alloys, machined and ground to a good finish. The introduction of stainless-steel seats and discs has much reduced maintenance troubles.

Seats are often premanently pressed into the body casting. Renewable seats may be preferable in instances where otherwise regrinding has to be repeatedly performed at short intervals to keep a globe valve tight. For the larger valves, however, the permanent seat made from first-class material or with stainless steel or monel trim, seems preferable. The use of a resurfacing cast-iron block for regrinding seat faces, of the regrinding apparatus for valve seats available in various designs, and of lapping apparatus should be known to readers.

Any distortion of the valve body, either caused by inner stresses, or produced by external forces will endanger tight closing. With flat-faced seatings secured by circumferentially located set screws, the threads of the latter should be treated with graphite compound before replacement, so that future removal is facilitated. Valve members with mitred faces require perfect alignment to avoid jambing. The replacement of a seat-ring by means of set screws is an art in itself, in order to avoid distortion. Special tools are required for machining hardened stainless steel seatings, and special chucks should be employed to maintain the correct shape during grinding. To loosen renewable valve-seats, or seats secured by a junk ring, it is recommended to use a good rust-solvent solution. By exercising excessive leverage during removal, a seat ring can be hopelessly distorted. When screwing-in a replacement seat, graphite compound on the threads will not only help tightening but will ease removal at a later date.

The usual finishing touch for any major valve-repair job will be a test for tightness under hydraulic pressure. Before assembly, the valve body should be subjected to a static pressure test. Afterwards a hydraulic pump test should be performed, and/or compressed air used when the body is immersed in water for testing the stem packing.

Parallel-slide valves

Although parallel-slide valves are sometimes used, they should not be chosen where close control of fluid flow is required, i.e., for fine throttling duties. Not even the bevelled globe-valve type is really suitable for close fluid control; "characterized" control valves should preferably be used, having V-port or parabolic valve discs, or the like. For open-and-shut duties, especially for larger pipe sizes, however, a great number of designs of parallel-slide valves are available. Occasional refacing and surfacing of the seatings will have to be performed, and regular inspection of seatings will decide the right moment for maintenance action. Suitable aids are either supplied or recommended by the valve makers, depending on design. Valves having pressed-in seating rings are usually refaced by mounting the valve body on the lathe or milling machine, with a correctly chucked valve-body so that no misalignment occurs.

Correct valve sizing

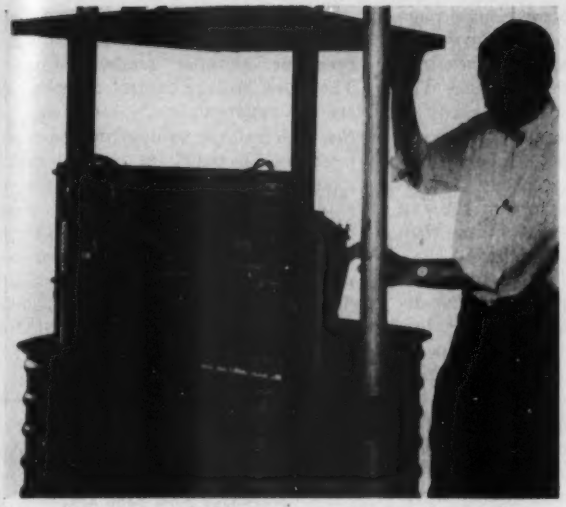
As a general ruling, the smallest size of valve which will handle peak loads with a reasonable pressure loss is the logical basis of choice. An undersized pipeline is just as bad as undersized valves; both can produce excessive pressure losses.

Grouping valves into three main groups can be done as follows: (a) open-and-shut types for stoppage of flow; (b) throttling valves for restricting flow at will, and (c) valves for control of the direction of flow, such as check valves, non-return valves and the like. All must be correctly sized if trouble is to be avoided. Moreover, special care has to be taken in the sizing of automatic-control valves for process control; this is, however, a job for the specialist, and is best left to the control-instrument engineer.

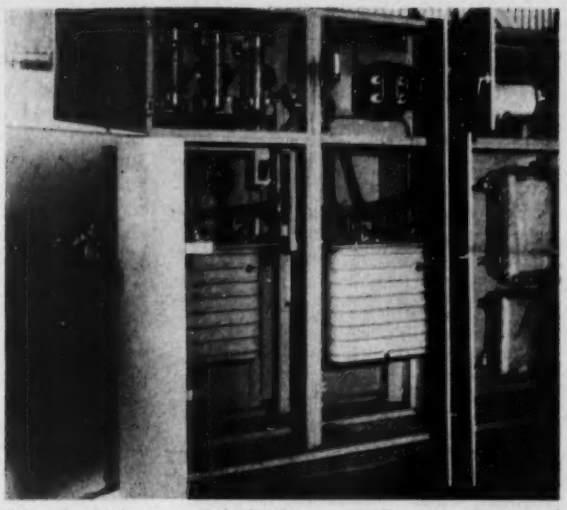
Maintenance of valves

What is usually called "preventive maintenance" of valves of any kind consists of regular periodic inspection and overhaul. In a smaller plant this will preferably be carried out by following a carefully prepared time schedule, and undertaken by a skilled fitter under the supervision of an experienced foreman responsible to the plant engineer. The organization of this maintenance job depends on the type and size of the plant and on the purpose for which the piping system is used. It may be quite a big job in the larger plant where hundreds of different valves have to be inspected and serviced regularly, but is easy in the smaller works. It pays for itself by reducing the general repair bill and

(Continued on page 572)



View of floor-mounted, lift-out type, oil-immersed controller.



View of cubicle-mounted, high-voltage controller with oil-immersed contractor.

Have you considered oil-immersed controls for problem areas?

T. F. BELLINGER and R. F. SCHOOF
Allis-Chalmers Mfg. Co.

RECENT developments in high voltage oil-immersed motor controls now provide paper mills with a choice between units designed for direct exposure in so-called problem areas, and general purpose equipment mounted remotely in a manufactured environment.

Problem areas are classified by the National Electric Code into three general classes: Class I, explosive gases; Class II, ignitable dusts; and Class III, air borne flammable materials, fibers, etc. In these classes are Groups A through G which specifically define the exposure. A further breakdown by divisions in Class I and II denotes hazardous or continuous exposure by Division I and semi-hazardous or intermittent exposure by Division II.

The increased use of 2000 to 5000-volt motors in problem areas rather than machines of 600 volts or less, has heightened interest in oil-immersed controllers.

In hazardous areas where small low voltage equipment is used, the problem is solved at reasonable cost with cast iron or cast aluminum enclosures. However, in the larger sizes of low voltage equipment ranging into hundreds of horsepower and in high voltage controllers, size and weight limitations preclude the use of explosion-resistant enclosures. For the high voltage class, the solution is to place all main arcing contacts at least six inches under oil.

Now that a completely self-contained, heavy-duty oil-immersed controller is available for high voltage control, the paper industry may find it advantageous to apply it, instead of locating general purpose equipment outside an area of corrosive liquids or in a purged room.

While the location of general purpose equipment outside a problem area is often a satisfactory solution, frequently the branch circuit becomes too long, the cost of installation high, and the line losses great.

As for the purged room, certain complexities prevail. These include the cost of the switch room, the continuous maintenance of pressure, the need for a source of uncontaminated air, and the safeguarding against open doors.

Special purpose controllers made possible by a new oil-immersed contractor are extremely versatile and adaptable to most of the problem areas. They can be had as cubicle mounted models, as floor-mounted lift-out units, completely self-contained with all high and low components under oil, and as frame-mounted, tank-lowering controllers with all relays housed in explosion-proof boxes. The latter type provides maximum versatility for synchronous motors or other special applications.

Advantages of oil-immersed controller

Particularly recommended for non-repetitive duty, the oil-immersed controller has certain operational and maintenance advantages beyond being non-arcing, unaffected by corrosive gases and acids, and impervious to build-ups of dust and other contaminants.

High voltage oil-immersed motor

controllers now have the same horsepower, voltage and interrupting ratings as air-break contactors which are recognized for their long switch life in highly repetitive service in non-hazardous locations.

Interchangeable with controller structures and assemblies used on high voltage air-break contactors, the oil-immersed units have comparable ratings of 1500 hp at 2300 volts and 2500 hp at 4160 volts, and an interrupting capacity of 50 mva at either voltage. This interchangeability, made possible primarily through a unique arc quenching principle which provides fast and efficient arc interruption, and newly developed high strength, arc-resistant insulating glass-polyester materials, assures maximum economy and standardization for chemical plant control equipment.

Based on operating experience, these heavy-duty oil contactors are equivalent to ratings of high voltage air-break contactors and superior to high voltage oil switches devised for circuit breaker mechanisms. Circuit breaker mechanisms used in controllers for hazardous areas are generally bulky, have a low life expectancy, require considerable maintenance, and are not designed for jogging or repetitive duty applications. The use of 2-wire automatic starting and stopping of such controller mechanisms can cause difficulty.

Recent developments in protective finishes make control equipment more suitable for direct exposure to highly corrosive atmospheres. Special preparations and applications of vinyl plastic finishes in pleasing hues and surfaces provide maximum protection against sulphur dioxide, hydrogen sulfide and chlorine atmospheres as well as salt spray.

Two general types of completely self-contained controllers are provided for maximum horsepower and voltage applications and different types of motors and starting procedures. Various standard and special operational and protective features can be had on each consistent with the application.

Cubicle controllers

The first type, classed as high-voltage, oil-immersed equipment, is of typical design normally used with conventional high voltage controllers with air-break contactors. Its control equipment is housed individually or in assembled groups in standard modular 90-inch high enclosures with a common 3-phase power bus. Each self-contained motor controller unit consists of: a 3-phase, gang-operated, non-load break type isolating switch; high voltage current limiting power fuses; step-down control transformer; current transformers; and heavy-duty, oil-immersed line contactor with control devices and components. The units have an interrupting capacity of 150 mva at 2400 volts and 250 mva at 5000 volts. The line oil contactor's 50-mva interrupting capacity is generally not utilized because of the fast fault clearing of the fuses, less than ½ cycle at maximum capacity.

All high voltage load interruptions occur under oil in the respective device containers; all arcing contact low voltage control components are in explosion-proof, corrosion resistant compartment boxes. The primary of the step-down control transformer is disconnected by a manually-operated, oil-filled switch. The gang-operated line isolating switch is mechanically interlocked with both the transformer disconnect switch and the oil-immersed line switch to prevent accidental opening or closing of the isolating switch while carrying any degree of power.

This type of oil-immersed control equipment in a cubicle arrangement is well suited for semi-hazardous applications or where mildly corrosive atmospheres or extreme amounts of dust and similar materials are present. It is designed for full or reduced voltage type of starting of squirrel-cage, synchronous and wound rotor motors, and is available for indoor or outdoor installations in the conventional arrangement with low voltage control components mounted on open air panels.

The self-contained, tank type

The self-contained, tank-type control equipment for use in highly corrosive atmospheres consists of a heavy-duty oil-immersed contactor similar to that found in the cubicle controllers with all high and low voltage arcing components in a common tank below a six-inch minimum oil level. Units can be arranged side by side and connected with a 3-phase common power bus. Optional equipment includes an externally-mounted, gang-operated load break, oil-filled isolating switch.

Equipment of this type provides interrupting capacities of 50 mva through switchboard type oil-immersed over-current relays which operate to open the line switch. Two relays suitable for delta grounded Wye systems are normally used. Three-phase fault relaying should be used for grounded Wye systems. Total fault clearing time is less than 8 cycles which is comparable with quick acting circuit breakers. Primaries of step-down control transformers are protected with oil-immersed current-limiting fuses.

Tank-type oil-immersed controllers suitable for outdoor installations are floor or elevated frame mounted. Their low voltage control components are oil-immersed in the same tank as the high voltage equipment and separated by a panel or in externally mounted corrosion resistant aluminum explosion-proof cases. Ratchet type hoisting and lower mechanisms permit quick access to the oil-immersed devices. The assemblies containing all the high and low voltage components under oil are particularly suited for extremely corrosive areas.

Selection of valves

(continued from page 570)

the cost of replacements, apart from the avoidance of idle periods which may affect the whole plant.

The attitude of some engineers towards valves is to "leave well alone" unless definite signs of deterioration have appeared, or until the valve has to be taken out of commission altogether because it refuses to do its job.

Very often the plant engineer is thus left to struggle haphazardly against actual valve breakdowns instead of being in a position to prevent them. The following is a tentative guide to plant engineers who are ambitious enough to undertake the sometimes arduous, but nevertheless rewarding job of listing the designs of all valves in a plant, collecting information about their behaviour in the past; it will help to work out a scheme of how to service valves in the future in a more efficient way.

In order to service all valves in an industrial plant properly, and to perform minor repairs in good time, it is obviously necessary that the plant engineer and the foreman who is responsible for upkeep of the valves shall know the individual characteristics of each unit, and its duty. The fact that most valves do not behave in a very spectacular way, makes it desirable to study sectional views in catalogues and in the fixing and maintenance instructions supplied by valve makers.

The best way to discover the details of each valve in a plant is to take them apart during out-of-service periods, perhaps section by section. The details should then be tabulated on index cards which in turn provide the basis for preventive valve maintenance. For large and important valves it is advisable to preserve a blueprint, supplied by the maker, properly filed and ready to be consulted when servicing these valves.

The use of pipe, fittings, pumps and valves in the pulp and paper industry

Part XIV — Application of pipe, fittings, pumps and valves on the paper machine

ROLAND L. ALLEN JR.
Vice President, Eastern Engineering Co.

The modern paper machine requires that great care be exercised in the design of the piping systems so that the machine's optimum capabilities may be obtained.

PAPER MACHINES, old or new, have five major piping systems and a varying number of minor piping systems, depending on the type of machine and the products produced. The five major piping systems are machine furnish, white water, vacuum, dryer steam and condensate, and lubrication. The minor systems may surface size for the size press or calender, coating for on-the-machine coaters, etc.

Machine furnish and white water systems

The modern paper machine requires that great care be exercised in the design of the piping systems so that the machine's optimum capabilities may be obtained. The machine furnish piping system is particularly influential on the machine's rate and quality of production. This system should be designed so that there are no pockets where air or dirt may accumulate or where fiber may stagnate. The interior surfaces should be smooth and free of roughness and crevices where fiber strings or slime may form. The piping should slope upward in the direction of flow. This slope should be a minimum of 1½ in. per foot of run. The high point of all piping should be continuously vented through a 2-in. or larger vent equipped with a throttle value and piped to the wire or couch pit. These vents will continuously expel air from the furnish piping system. This is necessary since air in the furnish interferes with proper sheet formation on the machine.

The white water system should be treated in the same manner as the machine furnish, since they are interconnected to a great extent. Any white water piping not connected to the furnish system need not be sloped.

The materials of construction used for the furnish and white water systems will vary according to the grades of paper to be produced. Carbon steel piping is extensively used for unbleached grades, while stainless steel is widely used for the bleached grades.

Contrary to general opinion, the machine furnish and white water piping may be constructed of lightweight thin wall stainless steel for approximately the same cost as for standard weight carbon steel. Frequently the use of stainless steel will result in a cheaper installation and will seldom result in a cost higher than 10 to 20 per cent more than standard weight carbon steel. The reason for stainless steel piping being competitive in in-

stalled cost around a paper machine is that the majority of the piping around the wet end of a paper machine is not straight but of complex configuration and the thin wall stainless steel fittings and flanges plus the labor of fabrication and installation are cheaper for thin wall stainless steel than for standard weight carbon steel.

For most installations, valves with cast iron bodies and bronze trim will give satisfactory service in the furnish and white water systems, even though the piping may be stainless steel. However, when stainless steel piping is used, electrolytic corrosion between the stainless steel piping and the bronze valve trim may take place under certain conditions. In these cases, valves with cast iron bodies and stainless steel trim will usually be satisfactory. Where complete protection is desired, all stainless steel valves may be used.

Pumps used for machine furnish and white water service are usually cast iron with bronze trim. Where conditions indicate, they may be cast iron with stainless steel trim, all bronze or all stainless steel. Since machine furnish consistency is usually less than 1 per cent, double suction type centrifugal pumps may be used on both the machine furnish and white water.

Vacuum system

The design of the vacuum piping system depends upon the vacuum pumps used. If the vacuum pumps are not capable of handling all of the water removed from the machine, water separators must be installed to protect the pumps. Since the separators are under a vacuum, pumps must be provided to expel the water that the seperators have removed. The water removed from the flat boxes and the couch may always be reused. Water removed from the presses must frequently be wasted since it usually contains felt fibers that are detrimental to many grades of paper.

Vacuum piping must be designed so that the water will continuously drain to the separators or to the vacuum pumps, if separators are not required.

Vacuum piping is usually constructed of standard weight carbon steel. However, some installations have stainless steel for that portion where the water is being recovered for reuse and conditions are such that carbon steel will contaminate the water.

Very few valves are used in paper machine vacuum systems. Where valves are used, they are generally cast iron body, bronze trim gate valves or all cast iron lubricated plug valves.

Steam and condensate system

The steam and condensate systems should be designed along the same standards used for these services elsewhere in the mill. It is particularly desirable to keep the number of flanged and screwed joints to a minimum in these systems since this piping is usually located in very close quarters and any leaking screwed or flanged joints are very difficult to repair.

Lubrication system

The lubrication piping system for the modern large paper machine is very complex and is one of the most vital systems connected to the machine. The design of the system is not particularly difficult, but requires attention to detail. Normally, the oil is supplied under pressure to the various bearings and gears and overflows to a gravity return piping system that returns it to a tank where it is filtered and returned to the system by pumps. The gravity return piping should slope downward in the direction of flow about 2 or 3 in. per foot of run.

The oil supply piping should be located so that it is protected from mechanical damage and so that it does not interfere with the normal operation and maintenance of the machine.

The modern lubrication oils used for paper machines generally contain detergents, anti-foamants and other additives. Frequently these additives react with copper and produce undesirable results such as sludge formation in the oil. Therefore, modern practice is to eliminate the use of copper in the oiling system. This is also desirable from the standpoint of mechanical damage since copper tubing is easily ruptured.

The general practice is to use dead soft, fully annealed and picked seamless steel hydraulic tubing with compression-type tubing fittings for all sizes ¾ in. and smaller. This tubing and the fittings are free of mill scale.

For sizes 1 in. and larger, standard weight seamless carbon steel pipe is used. This pipe should be pickled to remove all mill scale, and oiled after pickling to prevent rust.

Where butt welding fittings are used, they should also be pickled. It is not desirable to use cast iron or malleable iron screwed fittings since they both have mill scale and any attempt at pickling damages the pipe threads and causes poor screwed joints. Therefore, it is advisable to use 2000-lb. forged steel screwed fittings for sizes through 2 in. and pickled butt welding fitting for sizes above 2 in. The 2000-lb., forged-steel fittings do not require pickling since they are made by drilling the interior passage from a solid forging.

When purchasing piping materials for use in the lubrication system, care should be exercised to see that all materials are free from rust and mill scale, and that they are oiled and protected from rust until they are installed in service. This means that attention must be given at each step of purchase, transport, storage and erection.

During fabrication, pipe should not be cut with a torch, but should be sawed or cut with pipe cutters. After cutting to the proper length, the ends should be reamed to remove burrs. If the pipe is to be used with threaded fittings, it should be threaded with sharp dies and care exercised to prevent burrs or stripping of threads. After all fabrication operations have been performed on the pipe, it should be washed in solvent to remove all traces of foreign matter, dipped in SAE #10 oil to prevent rust and have its ends capped with metal or plastic caps. These caps should also be used during erection to keep foreign matter out of any open ends.

For the larger sizes where welded joints are used, the same methods of cutting should be used and the ends reamed. After cutting to length and reaming the ends, the pipe should be washed in solvent to remove grease, oil and foreign matter. The pipe should not be oiled until after welding. When welding fittings are used, they may be forged-steel socket weld or wrought-steel butt weld types. Where butt weld fittings are used or where two pieces of pipe are welded together, split-type backing rings should be used to prevent weld splatter from getting on the inside of the pipe. It is usually better to make branch connections with tees. However, socket weld outlet pads may be used if the opening in the pipe is drilled rather than flame cut.

After welding, the piping should be again washed in solvent and then oiled to prevent rust.

It is extremely important that every precaution be taken during fabrication and erection of lubrication piping to see that absolutely no dust, dirt, rust, scale or other foreign matter is built into the system. It is much easier to keep these things out of the system during construction than it is to remove them from the completed system. Since the system is so complex, attempts to wash the system with solvents or to pickle the interior of the completed system usually result in an excessive amount of time and money being spent for very poor (and often totally unsatisfactory) results.

How to save money on depreciation

PAUL LOCKWOOD

YOU can save income tax dollars by a careful application of the depreciation allowances to your paper machinery and equipment this year. The accelerated depreciation allowances are far more realistic than the old straight-line method and more nearly represent the true worth of your equipment subject to depreciation.

If you have purchased new equipment (second-hand or used equipment does not qualify for the accelerated depreciation methods) this year, you can apply the double declining balance method of depreciation on this equipment. It will save you tax dollars this year, and if properly handled during the time you own it and when it is replaced, you will have a large overall income tax saving.

Here's how the double declining balance method of depreciation works:

● Determine the new equipment's useful life

In calculating your depreciation under this accelerated method, you will need to determine the estimated life of the particular machinery. You can use the normal time you have been using for similar equipment, refer to the Bureau of Internal Revenue's Bulletin "F" for specific time, or make an estimate based on your judgment of current usefulness of the equipment.

Bulletin "F" provides guide figures for all types of paper, pulp and paper board machinery and equipment. It gives the average useful life in years. For instance, a rag stock digester is listed at 33 years, a coating machine at 28 years, shredders at 15 years, paper trimmers at 20 years, etc. You can use these figures or use your own experience and judgment in establishing the estimated useful life for your machinery.

● Reduce to an annual percentage

The percentage figure will be the percentage of the total cost of the equipment that is charged off each year. For instance, you might purchase some equipment for $3,500 and it would have a five-year useful life in your estimation. You would also estimate that at the end of five years the equipment will have a salvage value of $500. You would take an annual depreciation of one-fifth (20%) of the $3,000 depreciable value each year. Equipment that might have an estimated ten-year life would have 10 per cent of its value charged off each year.

To determine this percentage figure, divide the number of years in the estimated life of your new equipment by 100. This is the same method used to calculate the annual charge-off under the former non-accelerated income tax regulations.

● Double this percentage figure

Here is where the income tax savings enter the picture when you use this accelerated depreciation method. Instead of using the regular percentage figure, with the double declining balance method of calculating depreciation, you double this figure.

For instance, if you have new equipment with an estimated useful life of five years, you would normally charge off 20 per cent of its net cost each year. With this plan you double this percentage figure and have a 40 per cent depreciation deduction for each year.

● Deduct the doubled percentage figure as depreciation

After determining the annual percentage figure to be used with the double declining balance method, you deduct this from the original purchase cost (less salvage value) for your income tax depreciation deduction.

For instance, in the illustration of $1,000 worth of equipment with an estimated ten-year life, you would have a 10 per cent annual depreciation under the old straight-line method. With the new double declining balance method, you double this to 20 per cent. Next, you deduct this from the cost ($1,000), or deduct $200 as a depreciation allowance this year.

● Apply the same percentage of remaining balance

This is where the new method of calculating depreciation gets its name. In each succeeding year you own the equipment, you use the same percentage figure on the balance . . . . not on the first cost figure.

As a case in point, with the same illustration used of $1,000, the first year you would deduct 20 per cent of this or $200. The second year, you would again use the 20 per cent figure, but on the remaining balance or $800 ($1,000 less the first year's depreciation of $200). This would give you a second-year depreciation of $160 on your equipment.

Here is how this would work out for the ten-year estimated life of equipment under the old straight-line method and under the faster accelerated double declining balance method of figuring your depreciation:

	STRAIGHT-LINE	DECLINING BALANCE
1st year	$100	$200
2nd year	$100	$160
3rd year	$100	$128
4th year	$100	$102
5th year	$100	$ 82
6th year	$100	$ 66
7th year	$100	$ 53
8th year	$100	$ 42
9th year	$100	$ 33
10th year	$100	$ 27

(continued on page 578)

Rheology and the paper coater

WILLIAM R. WILLETS
Titanium Pigment Corp.

Part I — Instrumentation and experimentation

Rheology deals with the deformation and flow of matter. In this article an attempt is made to point out some of the rheological considerations in the testing and preparation of coating colors.

RHEOLOGY deals with the deformation and flow of matter. It has long been recognized that the flow properties of a paper coating greatly affected its applicability and the properties of the finished sheet. This is even more true today with the modern paper coater, which so frequently involves high speeds, high shears and much higher solids than formerly.

While there are certain analogies between paper coating colors and paints, the former usually have a much higher pigment to adhesives solids ratio. In a paper coating the pigment will generally comprise 80 per cent or more of the total solids, while in paints this will vary from below 20 per cent in some cases to over 65 per cent in others. (1)

The extreme variety of coating colors, base stocks and application methods certainly indicates the wide range of problems involved. The following discussion will attempt to point out some of the rheological considerations encountered in the testing of raw materials, the preparation of colors, their application on various types of equipment, and the properties of the finished sheet.

Instrumentation and experimentation

Probably the first rheological instrument used by a paper coater was the paddle with which he mixed his color. The manner in which the mix dripped off, plus his experience, gave an indication as to how it might apply manually, on an old brush coater or on a wallpaper printer. Later on, various efflux types, home-made pipettes as well as standardized Ford cups, etc. came into use, and undoubtly many are still being used. All these fairly simple methods have some application in control where the color formulae are reasonably constant.

Cobb and Lowe (2) in 1930 (shortly after the term "rheology" was coined) investigated the occurrence of defects known as "bird eyes" in paperboard coated on a brush coater. They used instruments then available including a MacMichael viscometer, a Gardner mobilmeter and a DeNouy tensiometer. Their experimental rheological findings correlated with practical application on the coating machine. One of their conclusions still seems very pertinent, regardless of the color or method of application: "The difference in behavior of . . . coatings can only be explained by consideration of (a) the internal structure of the suspension as manifest by the apparent viscosities, and (b) the change in composition occurring at the liquid-solid boundary during the application of the coating".

Dunn and Landes (3) in 1934 described the testing of coating colors with a metal pipette and a Stormer rotational viscometer, concluding that the former was satisfactory if properly calibrated. The colors involved, however, had total solids of less than 34 per cent and viscosities of under 200 cps. The discussion of their paper brought out comments that the pipette tests would only be comparable on the same type and makeup of color, and that two different compositions might give markedly different viscosities but

*This article is a condensation of a paper presented at a symposium which was sponsored by the Cleveland Society for Paint Technology, the Cleveland Paint, Varnish and Lacquer Association and the Case Institute of Technology, Cleveland Ohio, in September 1959. The complete paper was published in May 1960 issue of the Official Digest of the Federation of Societies for Paint Technology and this condensation is published through the courtesy of the copyright owner.

both apply well. It was also brought out that casein colors made with identical proportions using different types of clay gave MacMichael readings varying from 40 to 600. In 1937, during a similar discussion of a theoretical paper by Traxler (4), the statement was made that it was impossible to judge whether high or low viscosity gave the best coatings, as some colors of 400 on the MacMichael proved satisfactory and others of 44 gave brushmarks. It was pointed out that "flow properties" rather than "viscosity" probably held the answer with some colors being more highly thixotropic than others. (All this early work had to do with brush coaters, namely where the coating was applied by a rotating roll or brush to one side of the sheet which was then supported on a bed with the coating being levelled and smoothed by a series of reciprocating brushes. Such machines are rarely used today). While it might not be considered strictly as "coating" within the concept of this article it is interesting to note that, Cobb, *et al*, (5) at the same meeting where Traxler presented his paper, stated that, all other things being equal in the tubsizing of paper, the penetration of a starch solution into the sheet varied inversely as the square root of the viscosity of the starch dispersion.

Although up to this time the coating colors being applied had relatively low total solids and viscosities, as judged by many in use today, there was developing a keen realization that rheological characteristics were very important. This realization was brought about by the development over 20 years ago of coating on the paper machine at high speeds, usually with much more viscous colors, (6,7,8). Rowland (9) in 1941 noted: "The inadequacy of the usual viscosity measurements to characterize the coatability of the color is demonstrated by experience with the actual operation and by studies in process . . ." He pointed out the need of a fundamental study of the components of the color but went on to say: ". . . only as these laboratory findings are correlated with actual coating machine application can a completely adequate knowledge be gained," a statement which is still certainly valid today. By that time the importance of types of flow (as against single point viscosity measurements) was well recognized and extensive studies were underway at the Institute of Paper Chemistry (10). In 1942 Sheets (11) reported that the usual rotational viscometers such as the MacMichael and Stormer failed to measure the properties of thixotropy and dilatancy, which were so important in machine coating, and reported results using a type of rotational viscometer designed for that purpose. In 1943, Arnold (12) reported tests made high rates of shear, in the order of $8x10^4$ reciprocal seconds, using a technique involving a rolling cylinder dynamically balanced to insure uniform acceleration down an inclined plane, with the speed of the cylinder being varied by different inclination of the plate glass forming the plane. He stated that the nip viscosity measurements on a coating machine did not correlate with low-shear viscosity tests and that, furthermore, certain clay slips which were indicated to be weakly dilatant at low rates of shear actually were thixotropic at high shear. He also noted that viscosity measurements made at one rate of shear have little significance as an index of the flow behavior at different high rates of shear.

In 1947, Green (13) described a precision type of rotational viscometer, capable of attaining high shear and so constructed that the speed could be varied in small steps over this wide range. He expanded his concepts further in a volume published after his untimely death (14).

A multi-point viscometer capable of shear rates in excess of 5000 reciprocal seconds, which has received wide acceptance, was introduced in 1948 (15), and its practical applicability demonstrated by Smith, Trelfa and Ware (16). They were the first to report extensively on the relationship between the flow properties of coating colors and their application to paper at high shearing rates. They presented a theoretical treatment of roll shear conditions and gave a hypothetical discussion of "patterning", based on thixotropy. The original hypothesis developed to explain the nonpatterning of thixotropic colors was analogous to the after-levelling of thixotropic paints. They did not consider this a major factor in elimination of residual patterning, however, because of the short time available for levelling before the absorption of water would result in a setting of the color with the prevention of flow. They noted that the rheological procedures for predicting the operability of a color involved the characterization of the type of flow, a numerical calculation of thixotropy and the determination of viscosity at a high rate of shear. From such data it was possible to calculate "levelling indices" valuable in determining the degree of patterning. Colors having a levelling index of below 0.2 were found to be inoperable, from 0.2 to 0.35 borderline and those over this index probably operable. Thompson (17) pointed out that thixotropic pseudoplastic color with an index of only 0.17 was also operable and concluded further that levelling indices are all relative and that acceptable limits would vary with the type of coating equipment and weight of coating applied.

Lyons (18) has also discussed the effect of flow properties on patterning based on the functioning of the color in the coating roll nip. He showed that dilatant colors would develop intermittent shear blockage in the nips of roll coaters and develop chatter marks or patterns. Lyons stated that some colors may be so thixotropic that they are too viscous to permit ready application and that the proper speed of vehicle redistribution into the web may be adversely affected. He pointed out analogies between paper coating and printing as described by Zettlemoyer (19) and Myers and Zettlemoyer (20).

Such analogies were also noted by Smith, Engle, Howard, and Jones (21) who developed a high speed cinematrographic technique demonstrating the behavior of ink in a roll nip and showed the motion pictures produced at the Seventh TAPPI Coating Conference in 1956. At the annual meeting of the Society of Rheology in 1957 Miller and Myer (22) reported on the kinematics of film splitting inside a roll nip. They used a disc and cone apparatus especially designed to make high speed photographs and motion pictures showing the action in the nip. At slow speeds, fluids were shown to flow counter to roll direction into the region of low pressure where separation began. At high speeds, cavitation or bubble formation occurred in the low pressure region. The number of bubbles formed was counted as a function of speed, nip pressure and film thickness, increasing with increases in the first and third of these variables, and decreasing slightly with an increase in the second. Pigmentation increased the number of bubbles formed. The bubbles were shown to enlarge as they reached the filamentation stage. Such explanations of what occurs in a roll nip and the high speed photographs and motion pictures accompanying these talks seem very pertinent to paper coating.

Robinson (23) has presented interesting concepts supported by experimental evidence relative to the dispersion of pigments in a coating color, based on theoretical considerations presented previously (24). Dispersion is explained in terms of deflocculation or deaggregation. It results when a sufficient mechanical force is applied to overcome the bonds holding an aggregate together, using the axis of the particle as the mechanical lever through which the mechanical force is applied. Deaggregation may not be relative to the total power applied, for example through high speed mixing, but results from the force reaching each aggregate. In the case of dilute suspension high power may not subject individual aggregates to sufficient force to deaggregate them, merely pumping the fluid and dissipating as heat which results from viscous work rather than interparticle friction. With increased deflocculation or deaggregation, particles pack more closely and therefore occupy less volume — "relative sediment volume". A diagram can be prepared by plotting solids content versus relative sediment volume and actual composition, and consistency can then be related to the calculated line. Such a dispersion diagram explains the behavior of particles in a typical dispersion and permits the design of a suitable dispersion sequence. The dispersion diagram aids in understanding the different types of dispersion equipment, particularly in comparing high shear kneaders and high speed agitation. Mattson and Leighton (25) using a derivative of Robinson's equation have demonstrated the possibility of further practical application to starch conversion control, pigment dispersion measurements, pigment characterization, etc. Their experimental results showed that the high shear viscosities of high solids starch-clay colors should be interpreted on the basis of the theoretically derived viscosity equation relating the viscosity of a final color to the viscosity of the starch, the volume concentration of the pigment, the packed sediment volume of the pigment and a constant characterizing the color involved.

The comments given above may serve as some indication of the development of the application of rheology to paper coating. Such development is continuing at an increased pace and apologies must be made to the many unmentioned in the field who have also done and are doing splendid work. It should be noted that the Technical Association of the Pulp and Paper Industry for some years has maintained a rheology project at the University of Maine which has collected considerable data on viscometers and recently reported on the statistical interpretation of data in an attempt to correlate coating compositions, viscosity, application and the properties of the final coated sheet, (26, 27, 28).

Many types of viscometers are in use today and undoubtedly, even as this is being written, more are being developed. At the risk of being incomplete, the following may be noted. Among those in the low shear range are the Brookfield, Stormer and Norcross, although Ford cups and other efflux types are still in common use. In the high shear category are the Hercules Hi-Shear, the Hagan, the Precision-Interchemical, and the Fann, while the Merrill-Brookfield has recently been introduced. The rolling cylinder inclined plane device, referred to earlier, continues to offer attractive applications. The trend is definitely away from single point determinations towards determinations at varying shear rates and under different conditions. The subject is so complex that probably no single instrument, or method of measurement, or rheological concept can be correlated with all types of operation. **(To be concluded in Part II)**

Depreciation

(continued from page 575)

Thus, you can quickly visualize the income tax savings you will have in the early years you own your new equipment. In this example, your depreciation deduction is greater for the first four years with the double declining balance method of calculation than it is with the straight-line method. However, after the fourth year, the deduction is greater with the straight-line method.

In theory, you would never completely depreciate the equipment with this double declining balance method. You would always have a balance to be depreciated because you apply the established percentage figure to the balance — not to the original cost. In this illustration, you would have a balance in your asset account of $107 of the first cost of $1,000 at the end of ten years of depreciating if you kept using the double declining balance method for the full ten years.

● *Change methods later*

When you discover that your rate of depreciation is less under the double declining balance method than under the old straight-line method, you should make a shift in methods. The Internal Revenue Code permits you to shift from the double declining balance method to the straight-line method whenever you so elect.

However, when you make this shift in methods, you must use the remaining balance of cost as the base figure for your calculations. For instance, in the example cited we find that at the end of the fourth year, the balance swings in favor of the straight-line method. We take the balance of the cost, $410, and divide this by the number of years remaining, six, and get an annual rate of $68. This is less than the double declining balance method figure of $82 for that year.

Next, we try the fifth year and find that at the end of that year we have a remaining cost of $328 divided by the number of years remaining of five which gives us an annual rate of $65. This compares with the double declining balance method ($66), therefore, a change in methods should be made at this time.

With the same example used for illustration of $1,000 worth of new equipment with an estimated ten-year life, the comparative figures work out this way:

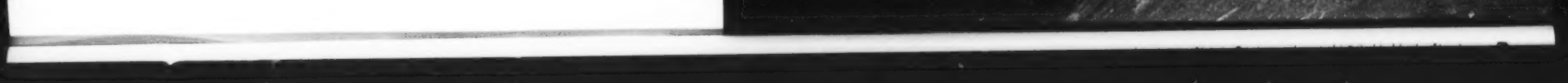
	STRAIGHT-LINE	DECLINING BALANCE
6th year	$65	$66
7th year	$65	$53
8th year	$65	$42
9th year	$65	$33
10th year	$65	$27

This system provides an opportunity to write off new equipment quickly through the double declining balance method and then to completely depreciate the equipment by a shift to the straight-line method of calculating your depreciation.

● *Sell old equipment — don't trade*

Modern management knows that it is often essential to replace old equipment before it is completely depreciated on the books. The estimated life may be how long the equipment will last, but to be competitive and to keep operating costs as low as possible, modern equipment is a must.

When a decision is made to buy new equipment there is a tax problem. Sell your old equipment . . . . don't trade! When you sell your used equipment, you have a gain over what your book value of the old equipment may reveal. However, this is a long-term capital gain and your income taxes on this will be a great deal less.



Beloit Research
dedicated to paper progress

coating improved by Double-Wet* application

Whether by roll application, air knife, or various trailing blade arrangements, Beloit's laboratory coating unit "proves its point" before a commercial installation is made. This type of coating research . . . in the area of advanced coating design . . . provides an essential saving in today's highly competitive coated paper and board markets. Beloit research engineers daily meet the demand for improved coating applications on grades ranging from the lightest sheet to the heaviest board grades—coating at speeds in the 3000 fpm range. Beloit "paperesearch" means *paper progress*—more efficient machines, always better paper.

AIR KNIFE FOLLOWING TRAILING-BLADE WITHOUT INTERMEDIATE DRYING

*PAT. APPLIED FOR

PHOTOS BY S. R. CHRISTENSEN

Beloit
machines
hold
speed
and
production
records
on tissue,
newsprint,
publication
grades,
kraft,
and
cylinder
board

your partner in papermaking

BELOIT IRON WORKS PAPER MACHINERY BELOIT WIS U.S.A.

BELOIT

PAPER MACHINERY

Our best safety efforts are demanded

Our forest, mills, and equipment are valuable — but our people are beyond price.

This Edward Benton Fritz Memorial Trophy was presented to the Laurentide Division of Consolidated Paper Corp. Ltd. to give national recognition for the mill's safety efforts during 1959.

TOP MANAGEMENT at the Laurentide Division of Consolidated Paper Corp. Ltd., located at Grand 'Mere, P. Q., Canada, have always demanded the best in safety efforts from all employees. Because of this, the safety history of this company has recorded an excellent reputation — a reputation that the company still maintains today.

National recognition was given to the company during the 1960 National Safety Congress held in Chicago during October, when the Laurentide Division received the 1959 Edward Benton Fritz Memorial Trophy (see page 586). This trophy will be added to the many others received by the company in the past.

Since 1916

Safety efforts, on an organized basis, started about 1916 at Laurentide. By 1927, when Laurentide became the central mill in the Canada Power & Paper Corp., the mill became a leader in industrial safety in their part of the world.

The most important factor in keeping this mill's fine reputation in safety work has been a series of division managers who have insisted upon two aims — safe working conditions and safe working practices — and who have known how to go about achieving those aims. These managers have been fairly strict with their men, but never tough. They have held to the philosophy — "Where mercy tempers justice, then co-operation will follow". The key word here is probably co-operation, for the Laurentide personnel have always been working as a team.

Harry Turner, who had been safety officer at Laurentide, became director of safety for the corporation until the time of his death in 1938; and Ray Duval took over the Laurentide safety and fire prevention responsibilities, a position he filled with distinction until his retirement in 1951.

At present, Julius Draper is safety director for the corporation (his position held since the death of Harry Turner in 1938); and Joseph Buki is safety inspector at Laurentide (his

position held since the retirement of Ray Duval).

Few safety rules — more training

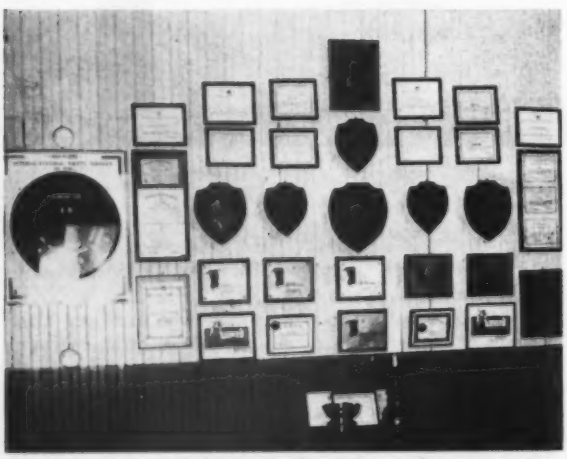
From the office of the safety director, safety news letters to supervisors are sent out regularly as part of the safety work. These letters carry the corporations safety news and are sometimes, as the occasion demands, aimed at a particular division or department.

Since 1942, when H. O. Sprinkle's article entitled "We Fix Responsibilities" appeared in the National Safety News, the Laurentide Division has used one of his statements — "The prevention of accidents is the logical and inescapable result of good workmanship" — as their watchword. The company has designed Sprinkle's article, divided into five chapters, into a guided reading course for all supervision. This includes a "Manager's Letter" and covering letters for each chapter from the safety department. All of this is considered required reading and is reviewed every few years to cover the new supervisors. This phase of the safety program has been working very successfully for the company. The National Safety Council literature has also been the main source of information and instruction for over 30 years. The company has very few safety rules, as such, but spend much effort on safety training.

Another routine, but very important part of the safety program, are the safety meetings. These meetings are held with top supervisory staff, foremen, and the rank and file. The latter meetings are held at least once a month. Since 1946, it has been a practice for the foremen to meet regularly with their men in small informal groups. These meetings are conducted by the foremen and are held usually once a week. The company has learned that these small informal meetings are now perhaps the most important safety meetings held. Julius Draper endeavours to attend all safety meetings which are held, except those called by and conducted by individual foreman.

The safety training is handled by a team which, among others, includes the safety inspector and the training organizer. Some of the subjects covered under this program includes: a process course; organization work and merit rating; spot training courses; newsprint machine operation; English conversation (a great majority of Laurentide's employees are French speaking); and shop mathematics. The program also handles advice and help on night school courses; correspondence courses; Job Instruction Training (J.I.T.) and Job Relations Training (J.R.T.) courses for supervisors.

Pictured from left to right are: Julius Draper, director of safety for the Corporation's mills; E. T. Buchanan, division manager; E. R. McMullen, general superintendent; and Joseph Buki, safety and fire inspector.



Safety awards and trophies won by the company have been placed in the safety training room. This collection bears the record of the company's safety efforts and gives an incentive to all employees to uphold their fine reputation.

Mill operations

To date, the Laurentide mill operates eight newsprint machines ranging in width from 83 in. to 164 in. The two 164-in. machines were designed in the Laurentide engineering office and when put into operation late in 1920 were the only machines to run at over 1,000 fpm. The company's cardboard machine produces 50 tons per day. The Laurentide newsprint capacity by N.A.C. rating is 522 tons per day. Many grades are manufactured including rotogravure and offset finish paper. The company also produces spiral-wound cores for paper rolls, up to 4,955 ft. per day.

Through the years, the mill has kept pace with new processes and equipment, giving the mill a reputation as a modern producer.

PUSEY AND JONES • PUSEY AND JONES • PUSEY AND JONES • PUSEY AND JONES

PUSEYJONES
"RAPI-DRAPE" FOURDRINIER •
PUSEYJONES STEAM JOINTS •
PUSEYJONES DRY PARTS •
PUSEYJONES POPE TYPE REELS •
PUSEYJONES PLASTOMETERS •
PUSEYJONES AIR GUIDE •
PUSEYJONES VACUUM
PICKUP •

NOW THE NAME IS Inglis

Now that John Inglis Co. Limited has acquired the paper machinery patents and assets of the Pusey and Jones Corporation, Inglis modern plants have become the new home of the machines and parts which have given papermakers the lead in today's race against production demands for quality and quantity.

Inglis will continue to improve and develop those features of design and manufacture for which the name Pusey and Jones is known, as well as Inglis' own designs.

Inglis is ready today to supply technical advice, new machines or parts, and to provide full service to existing Pusey and Jones machines anywhere in the world.

Head Office and Manufacturing Plant, approximately 475,000 square feet, 14 Strachan Avenue, Toronto.

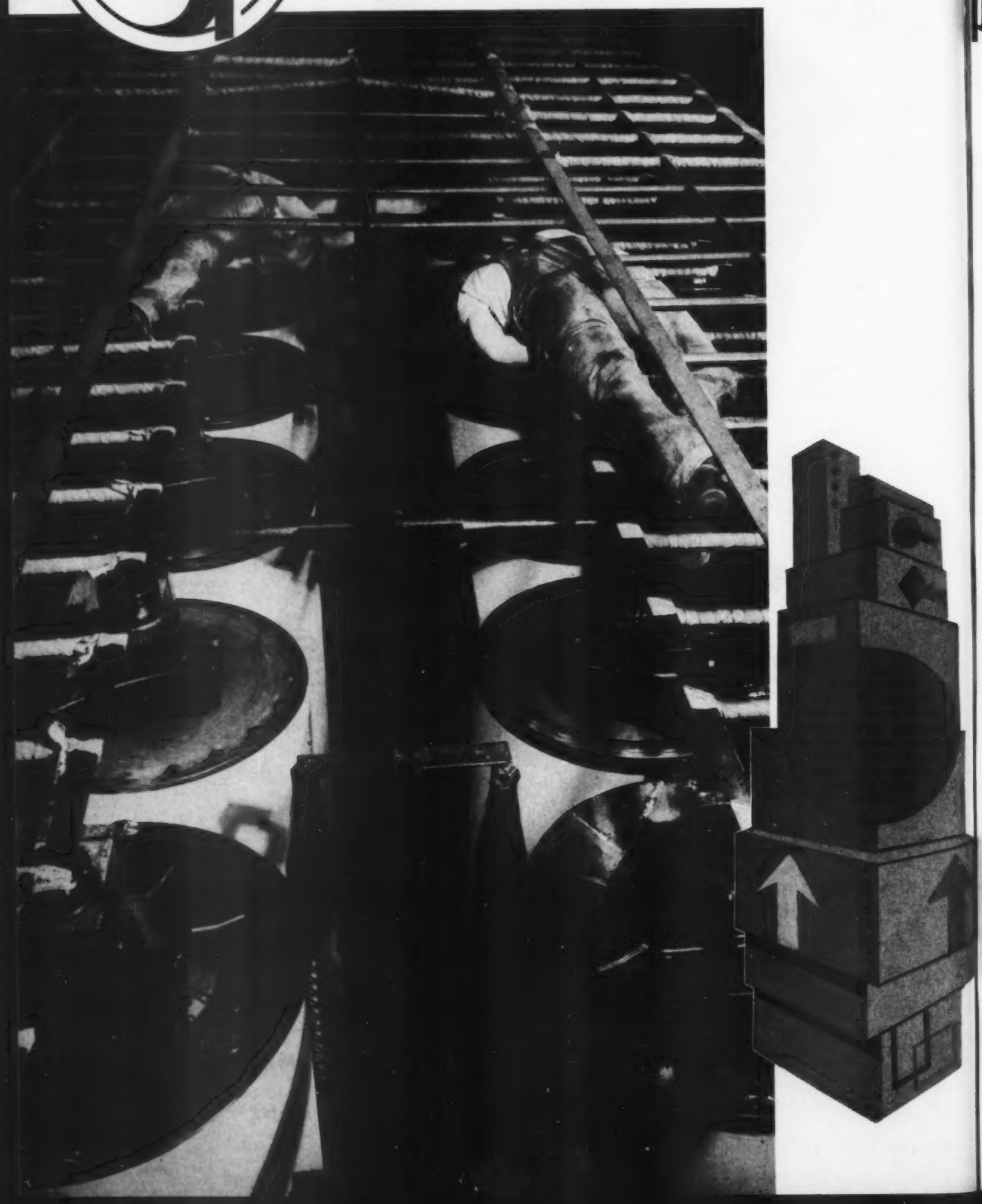
Scarborough Works, approximately 350,000 square feet.

JOHN INGLIS CO. LIMITED PAPER MACHINERY DIVISION

14 STRACHAN AVENUE • TORONTO, CANADA X134

For more data circle 118 on Post Card

LAWRENCE PAPER CO. teams w
p

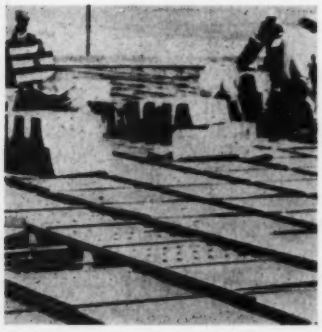


with HUYCK to set an ALL-TIME RECORD producing SPECIALTY MEDIUM

Late last year, skilled papermakers of Lawrence Paper Company, Lawrence, Kansas, scored an all-time record in the production of their celebrated Jayhawk Freezurboard — an exceptionally sturdy, moisture-resistant corrugated medium made from pulp impregnated with a bituminous substance. The uniquely constructed high dryer stack, multi-cylinder machine, running for 454.6 hours, chalked-up a new high of 1,598,939 pounds of paper in a variety of grades — all carried by a Huyck 4-D treated bottom felt, lasting 30% longer than any clothing previously used.

Needless to say, we are proud of the part Huyck plays in helping Lawrence's famous Jayhawk products fulfill their promise to "*carry the load to the end of the road,*" a familiar Lawrence slogan that also expresses the sentiments of Huyck feltmakers.

JAYHAWK FREEZURBOARD FORMS PRODUCED BY LAWRENCE PAPER COMPANY'S CONSTRUCTION DIVISION.



JAY-PANS - forming medium for concrete construction.

JAY-VOIDS — asphalt-impregnated corrugated forms.

Huyck Felt Co.,
Rensselaer, N. Y.
Aliceville, Ala.;
Division of Huyck Corporation.
In Canada: Kenwood Mills Limited,
Amprior, Ontario.

HUYCK FELTS

NEW HUYCK FELTS ★ INDUSTRIAL FABRICS

FIRST IN QUALITY • FIRST IN SERVICE SINCE 1870

For more data circle 119 on Post Card

A. Scott Dowd (left), president of Fritz Publications Inc., presents the Edward Benton Fritz Memorial Trophy to Julius A. Draper, director of safety for Consolidated Paper Corp. Ltd., Grand'Mere, Quebec. This award is presented each year by Fritz Publications Inc., publisher of THE PAPER INDUSTRY, to give national recognition to the mill which achieves the most outstanding safety record during the contest year. The Laurentide Division of Consolidated Paper Corp. Ltd. of Grand'Mere, Quebec, demonstrated the highest achievement among the 322 pulp and paper mills entered in the 1959 Paper Industry Safety Contest. The presentation was made during the joint luncheon with the Woods Products Section during the 48th National Safety Congress.

Consolidated receives national

MEMBERS OF THE Pulp and Paper section of the National Safety Council held their 48th meeting at the Conrad Hilton Hotel in Chicago from October 17 to 20, 1960.

OPEN SESSION

General Chairman, George R. Merriman (International Paper Co., Mobile, Ala.) opened the first general session with a progress report and other opening remarks. This was followed by an introduction to the keynote address—"Safety for Profit"—given by Hugh A. Black (director of industrial relations for Mead Corp., Chillicothe, Ohio). In his talk to the group, Black spoke of the "profit squeeze." This squeeze has arisen out of the dilemma of rapidly rising costs of business coupled with stable or softening prices, leaving less each year in terms of net earnings and dividends for shareholders. Accidents are a direct drain on profits. Their costs are wholly unnecessary to the production of any product. Accidents are important to cost cutting and to profit development because unlike many other costs of doing business, they can be reduced or at least prevented from climbing and are unique in this respect. When trying to sell a cost-conscious business man on some sort of safety activity, it is Black's opinion that actual costs of accidents can be accurately measured. Black recommended a procedure found in the text "Safety Management" by Simons & Grimaldi, which describes a simple method for ascertaining what the actual costs are.

Following the keynote address, H. E. Newbury (safety supervisor for the Ecusta Paper Div., Olin Mathieson Chemical Corp., Pisgah Forest, N.C.) spoke on—"Off-the-Job Safety".

"It appears to be a simple matter," Newbury stated, "for our employees to put on a cloak of safety when they enter the plant, and to discard it as they pass through the gate on their way home. These same employees insist that 'safetywise,' every suggestion at the plant should be followed immediately. And yet, they neglect their homes, their loved ones, and their own safe actions away from the plant.

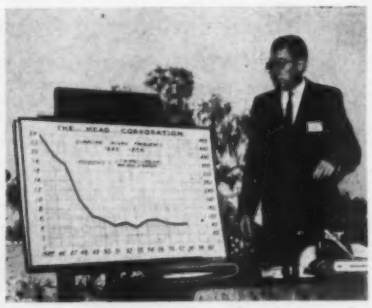
"Regardless of how strong management's interest might be from the humanitarian standpoint, lets not forget that they are also vitally interested in accident prevention both on and off the job, from the standpoint of reducing operating costs. No plant, company or corporation can stay in business without showing a steadily increasing profit to more than match rising operating costs. It is the responsibility of every person connected with accident prevention programs, as well as all others in supervisory positions, to help assure them of showing a steadily increasing profit! This can be done by each of us doing our utmost to help eliminate the needless cost of both personal and non-injury accidents—on and off the job." Newbury told the story of what his company was doing in the way of cutting down accidents outside the plant.

NOMINATING COMMITTEE

Representing the Nominating Com-

H. E. Newbury

"Off-the-Job Safety"



Hugh A. Black

"Safety for Profit"

recognition at 1960 NSC meet

mittee, Earl F. Ripstra (Container Corp. of America, Chicago) reported to the group on the nominations for the 1960-61 officers. The new officers were then elected.

GENERAL SESSION

On Tuesday afternoon the second general session met with D. V. Hill presiding. Julius A. Draper, (Consolidated Paper Corp. Ltd., Grand' Mere, Quebec) was first to speak to the group. In his talk — "Consolidated's 30-year climb — Is There An Easier Way?" — he told the complete story of his company's safety program. (This story is on page 581 of this issue).

Dr. Roger B. Maas (Employers Mutual Liability Insurance Co. of Wisconsin, Wausau, Wis.), followed by speaking on — "The Conservation of Hearing in the Paper Industry".

The day's program ended with a symposium on "The Seven Basic Steps of Safety". Presiding for the group was Harris K. Williams (International Paper Co., Mobile, Ala.). Panel members and topics discussed were "Company Policy" by Arthur Carle (Northwest Paper Co., Cloquet, Minn.); "Getting Cooperation" by Ralph E. Myers (Mead Corp., Chillicothe, Ohio); "Accident Prevention and Analysis" by Alfred B. Barnes (Fibreboard Paper Products Corp., Oakland, Calif.); "Records and Statistics" by R. E. Scott (Ontario Pulp & Paper Makers Safety Association, Toronto, Ontario, Canada); "Training" by Harry Hahn (Hammermill Paper Co., Erie, Pa.); "Inspections" by C. W. Matzenger (International Paper Co., Mobile, Ala.); and "The Foreman's Responsibility for Preventing Accidents" by James J. Pinkston (Crossett Co., Crossett, Ark.)

GROUP MEETINGS

The following group meetings took place on Wednesday and Thursday; speakers and subjects covered were:

Paper manufacturing

Presided by Merlin C. Race (St. Regis Paper Co., New York, N.Y.). "Paper Winding with Safety" was the subject of Joseph Calderone (Cameron Machine Co., Dover, N.J.) Kenneth Boober (St. Regis Paper Co., Bucksport, Maine) followed with "Is There a Price Tag on Safety?"

Pulpwood logging

Presided by E. C. Cordon (Louisiana Forestry Commission, Woodworth, La.). Jefferson D. Keith (American Pulpwood Association) discussed "An Association's Assistance to an Industry's Safety Program". A. R. Bentley (Bowaters Southern Paper Corp., Calhoun, Tenn.) discussed "Safety Posters for Southern Woodland Hazards".

Folding box & shipping containers

Presided by Karl F. Simpson Jr. (Folding Paper Box Association of America, Chicago). This group presented a symposium entitled "Safety as a Facet of Effective Management". Members of the group consisted of: Earl F. Ripstra (Container Corp. of America, Chicago); Jack Dunman

Claire L. Lyon, corporate employee relations manager for Scott Paper Co., Chester, Pa., (left), presents the Arthur Hoyt Scott Award to Julius A. Draper, director of safety for Consolidated Paper Corp. Ltd., Grand'Mere, Quebec. This award, given annually by the Scott Paper Co., Chester, Pa., to the company (multi-plant) making the best safety achievement for the contest year, was presented during the joint luncheon with the Wood Products Section during the 48th National Safety Congress.

(Mengel Co., Louisville, Ky.); William Atkinson Jr. (Continental Can Co., Chicago); and Oscar P. Rutledge Jr. (Pollock Paper Co., Dallas, Texas).

Insulation & roofing

Presided by William Bigham (Abitibi Corp., Alpena, Mich.). O. B. Eustis (Abitibi Corp., Alpena, Mich.) was the discussion leader for a panel discussion on "Management, Unions and Safety". Participants were: John W. Blewett (Kaiser Gypsum Co. Inc., St. Helens, Ore.); Charles J. Ford (State of Michigan Conciliator, Kalkaska, Mich.); Ted Linebaugh (Local No. 12-260, I.W.A., Alpena, Mich.); Sherman T. Marker, (Marsh & McLennan, New York, N.Y.); H. R. Mesler Jr. (Ruberoid Co., South Bound Brook, N.J.); and Malcolm Trach (I.W.A., Bemidji, Minn.).

Paper converting

Presided by Harold Hewitt (Bemis Bro. Bag Co., Peoria, Ill.). "Salesmanship in Safety" was the subject covered by Lloyd R. Larson (Dohrn Transfer Co., Rock Island, Ill.). "What's Your Safety Problem?" was discussed by Allan H. Watts (Union Bag-Camp Paper Corp., Savannah, Ga.).

Pulp manufacturing

Presided by Robert M. Gilmore (Rayonier Inc., Hoquiam, Wash.). This group presented a symposium on "Accident Prevention in Pulp Manufacturing". Members of the group were: W. B. Ballinger (Brunswick Pulp & Paper Co., Brunswick, Ga.); Jack F. Robertson (Crown Zellerbach Corp., Portland, Ore.); A. E. Minor (Ontario-Minnesota Pulp & Paper Co. Ltd., Kenora, Ontario); R. E. Bell (Crossett Co., Crossett, Ark.); William Van Hout (Kimberly-Clark Corp., Kimberly, Wis.).

D. V. Hill, newly elected general chairman for the Pulp and Paper Section for 1960-61 gives recognition to George R. Merriman for his efforts in serving as general chairman for the section during 1959-60

Joint session with wood products

Presided by A. F. Reinwart (T. H. Mastin & Co., St. Louis). Roy Randt (Oliver Corp., Chicago) talked on "Tractor Safety". This was followed by E. Paul LeRoy (Weyerhaeuser Co., Chehalis, Wash.) whose talk was entitled: "Standardization of Logging Signals Is Effective". Merrill D. Ely (U.S. Army Engineer Div., North Pacific, Portland, Ore.) spoke of "Coordinating the Safety Program with the Independent Contractors".

JOINT LUNCHEON

The annual joint luncheon with the Wood Products section and the Pulp and Paper section was held on Thursday, highlighted by the presentations of the National Awards.

The Edward Benton Fritz Memorial Trophy was presented by A. Scott Dowd (president and publisher of THE PAPER INDUSTRY, Fritz Publications Inc., Chicago, Ill.) to the Laurentide Division of Consolidated Paper Corp. Ltd., Grand 'Mere, P.Q., Canada.

1959 SAFETY CONTEST

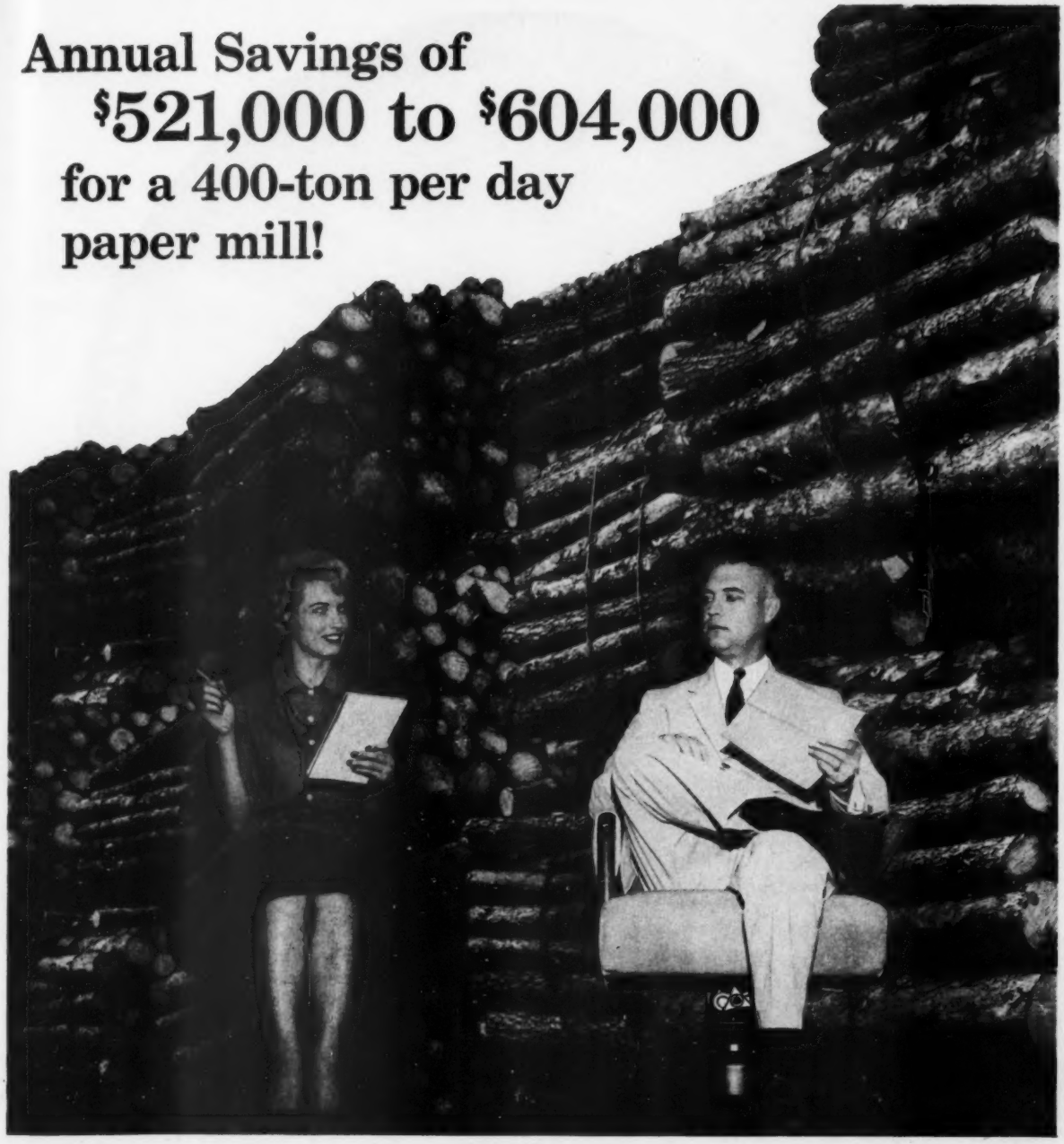
There were 689 participants who finished in the 1959 competition with ranking positions consisting of 322 pulp and paper mills, 352 converting plants, and 15 pulpwood logging units. This was 17 more than the total number that finished the 1958 contest. Total exposure reported by all contestants was 588,490,000 manhours—an increase of 2 per cent over 1958. There were 4,696 reported injuries—an increase of 7 per cent.

The cumulative frequency rate of all divisions except pulpwood logging was 7.27—an increase of 4 per cent compared with 1958. The cumulative rate of pulpwood logging was 33.43—a decrease of 7 per cent. The Pulp and Paper Mill Division increased its frequency by 2 per cent to 6.67. The Converting Division increased its frequency by 5 per cent to 8.53.

There were 100 units which completed the contest with perfect scores.

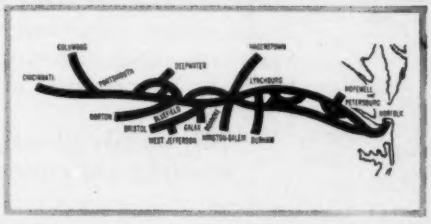
1960-61 officers for the Pulp and Paper Section are pictured here. Left to right are: Newsletter Editor Robert J. Gell (staff assistant for the Paper Mills Division, Eastman Kodak Co., Rochester, N.Y.); Secretary Bob M. Gilmore (general safety supervisor for Rayonier Inc., Hoquiam, Wash.); General Chairman and Program Chairman V.P. Coulon (safety director) for Sealright-Oswego Falls Corp., Fulton, N.Y.

Annual Savings of $521,000 to $604,000 for a 400-ton per day paper mill!



It's a fact! Projected operating costs of a pulp paper mill on a site in N&W territory are far less than operating costs of mills now supplying this market. Actual savings are spelled out in an authoritative, recently-completed comparison made by Fantus Area Research, based on their years of plant location service. From it, you can see how transportation costs may be cut more than $400,000 — fuel, steam and power costs reduced as much as $200,000.

Other phases of the report analyze markets, labor, raw materials, taxes, industry trends — every factor pertinent to locating a mill at these profitable sites. Make sure your company is the one that capitalizes on this major competitive advantage. **Write on company letterhead to H. P. Cotton, Assistant Vice President, Norfolk and Western Railway, Roanoke, Virginia.**



N&W

Nation's Going-est Railroad

MANY OTHER TYPES OF INDUSTRY can slash operating costs with plants in N&W territory. Fantus proves it in dollars and cents.

For more data circle 120 on Post Card

Specify VICKERY DOCTORS

AND BE SURE OF

correct engineering for each and every roll

correct application to each and every roll

Vickery Doctors come in twelve different design variations to meet the variations in roll diameter, length, composition, temperature and conditions of service. For any given roll on your machine or stack, there is a Vickery Doctor *engineered* to keep the roll surface doing its best work continuously.

Why not take advantage of the unequalled doctor engineering and application knowledge and experience that is back of every Vickery Doctor installation?

BIRD MACHINE COMPANY

SOUTH WALPOLE, MASS.

REGIONAL OFFICES: EVANSTON, ILLINOIS
PORTLAND, OREGON • ATLANTA 9, GEORGIA

Canadian Manufacturers of Bird Machinery
CANADIAN INGERSOLL-RAND COMPANY, Limited, Montreal

For more data circle 121 on Post Card

CURRENT COMMENTS

Leaders prophesy next 15 years—Tariff Commission releases final report

WARREN B. BULLOCK

The leaders of the United States and Canadian paper trade associations have gone on record as believing that the paper industry will expand mightily in the years to come.

R. M. Fowler, president of the Canadian Pulp and Paper Association prophecied the doubling of the world's production in the next fifteen years in a statement issued in recognition of the 150th anniversary of the Canadian industry. Howard E. Whittaker, president of the American Paper & Pulp Association, estimated that 1960 production of paper and paperboard in the United States would be half a million tons above that in 1959.

Analyzing United States conditions, Whittaker said that the 1960 output would be 2 per cent over that of 1959, but added that production in 1959 was 10 per cent over that in 1958. Higher costs of labor and materials, he said, will tend to prevent any rise in prices in the immediate future. Paper consumption, he added, had been ahead of production for the first half of the current year, with capital expenditures of $740,000,000 through 1960 as compared with $630,000,000 in 1959 and $578,000,000 in 1958.

The privately financed Canadian-American committee (organized in 1957 to study Canadian-American relations) filed a report in which it was charged that anti-trust laws of the U.S. discouraged local control and local ownership of the Canadian subsidiaries of U.S. corporations. Canadian criticism of American control of Canadian paper companies has been growing rapidly. R. M. Fowler, head of the Canadian paper industry and Canadian co-chairman of the committee, and R. Douglas Styart, head of the Quaker Oats Co. and representing the United States, jointly sponsored the report.

North American newsprint production continues to gain month by month over comparable monthly records of past years. Meanwhile, however, Russia is entering the Latin-American newsprint marker, particularly with shipments to Cuba. It is said that two shipments of 1,000 tons each have been unloaded at Havana, but only under such strict military guard that no photographs of the unloading were allowed. Efforts are being made to place similar orders in other Latin-American countries.

Tariff report

After six years of study, the U.S. Tariff Commission has completed the investigation ordered by Congress to provide the basis for future legislation leading to the simplification of the present tariff structure. The final report, printed in several volumes to be released this month, makes radical changes in the whole format of the tariff schedules. The Commission makes no effort to adjust tariff rates, but the proposed, simplified schedule would cut the present fifteen schedules of dutiable merchandise plus the additional free trade listings to eight, combining various groupings. In the paper field, for instance, the simplification would group as originally scheduled all types of printing paper from India bible to standard newsprint, and also would condense the many types of tissue paper. Instead of the present system of numbered paragraphs within a schedule, such as paragraphs 1401 to 1413 in the paper area, the proposed new system would reduce all schedules to a decimal system. Printing papers, for example, would be numbered from 252.60 to 252.69. Whether the final recommendation follows out this original recommendation remains to be seen. The Commission report makes no suggestions even indirectly for rate changes, but would provide a basis for a possible future revision of the existing tariff act, originally passed in 1930 and later modified by amendments.

Corporation changes

Union Bag Camp Corp. has filed formal denial of the charges of anti-trust legislation with the Federal Trade Commission which will probably turn the case over to an examiner for hearings. Union Bag bases its denial on the claim that the purchases of various bag companies has not had the effect of lessening competition in the bag manufacturing field. The company admitted the mergers with five other companies in a scare of states east of the Mississippi.

While Union Bag is fighting charges of anti-trust violation, mergers by other companies have been announced: The Riegel Paper Co. has registered an issue of $10,000,000 in bonds, of which about $4,000,000 will be expended for improvements. Meanwhile, the company through its merger with Lassiter Corp. secures control of Bloomer Bros. Co., Fairtex Corp. and Branson Yarn Co.

• • •

Hammermill Paper Co., which lost in an attempt to secure United States Envelope Co., has acquired the Union Envelope Co. of Richmond, Va., and arranged to buy the remaining assets of Old Colony Envelope Co. of Westfield, Mass., of which Hammermill earlier had purchased majority control.

• • •

Officers of the former United States Printing & Lithographing Co., now a division of Diamond National Corp., are assuming top echelon control of the latter corporation, though the printing company's sales prior to the merger were lower than those of the corporation's other divisions.

• • •

Diamond Match Co., which had been advancing into the paper field, changed its name to the Diamond Gardner Co. when it merged with the Gardner paper box interests of Ohio. With the later acquisition of the print-

B&W
WELDING
FITTINGS

MADE BY MEN WHO KNOW TUBING

B&W Welding Fittings manufacturing is integrated with the Division's own tube-making and steel-making facilities. Consider the relation between tube-making and the manufacture of welding fittings . . . in addition to knowing welding fittings manufacturing, B&W knows of the making of tubing from which fittings are produced. This knowledge plus integration of facilities permits B&W to provide superior fittings, completely quality-controlled, matched to end-use service. It also means on-time deliveries of fittings made from tubing of the specialized steels because B&W can closely control manufacturing schedules from melt to the shipment of the finished product.

B&W Welding Fittings and Flanges are available through qualified distributors in carbon steel and the B&W CROLOYS in a complete range of types and sizes. Write for B&W Bulletin FB502. The Babcock & Wilcox Company, Tubular Products Division, Welding Fittings Plant, P. O. Box 230, Beaver Falls, Pennsylvania.

B&W

THE BABCOCK & WILCOX COMPANY

TUBULAR PRODUCTS DIVISION

TA-9079-WF2

Seamless and welded tubular products, solid extrusions, seamless welding fittings and forged steel flanges—in carbon, alloy and stainless steels and special metals

For more data circle 122 on Post Card

Current Comments . . .

Allied Paper Corp. of Chicago, Ill. has acquired the Charles E. Brown Printing Co. of Kansas City, Mo. The Brown Co. will become the fifth rotary forms manufacturer to join Allied's Business Forms Division. Other Forms Division companies include: American Register Co. of Boston, Mass.; Carmax Corp. of Houston, Texas; Stephen Green Co. of Philadelphia, Pa.; and the Egry Register Co. of Dayton, Ohio.

• • •

Albemarle Paper Mfg. Co. of Richmond, Va., has acquired the operating assets of Armstrong Container Corp. of Baltimore, Md. Armstrong manufactures a wide variety of corrugated paper shipping containers. Charles J. Byrne, president of Armstrong, stated that the association with such an integrated and assured source of supply will enable Armstrong to increase substantially its ability to manufacture a wider range of quality containers.

• • •

Diamond Match Co., which had been advancing into the paper field, changed its name to the Diamond Gardner Co. when it merged with the Gardner paper box interests of Ohio. With the later acquisition of the printing company the name was again changed, this time to Diamond National Corp. Robert G. Fairburn, originally head of Diamond Match and its president from 1947 to 1959, became chairman of Diamond Gardner and later of Diamond National. He is retiring as of December 31. Meanwhile William H. Walter, former president of the printing company, has become president of Diamond National. His son Richard, former executive vice-president of United States Printing & Lithographing Co., has been made vice-president of Diamond National.

Financial notes

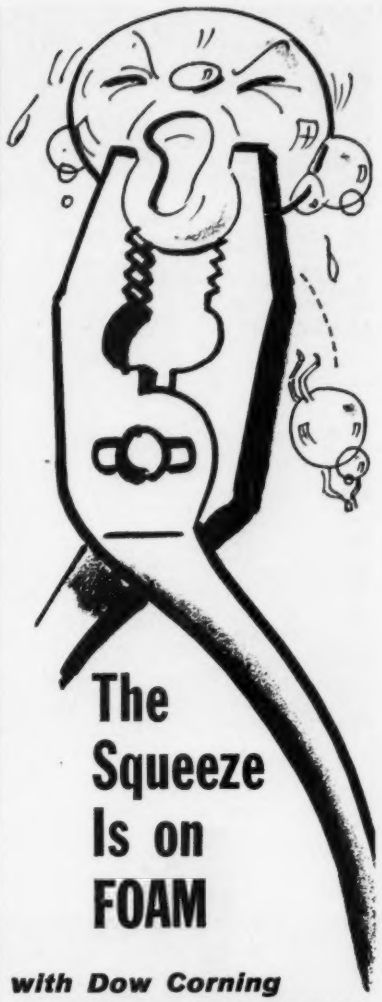
Paper mill securities during late September and early October followed the balance of the market downward, and buying enthusiasm was much less than impressive. A statement by the New York Stock Exchange listing, stock sales and purchases by "insiders" (paper company officials) showed that the sales of their own company securities were about double the amount invested on the buying side.

One of the most important financial developments of the year is the plan of International Paper Co. to split its common stock three for one. This was announced by John H. Hinman, chairman of the board, in calling a special meeting of stockholders December 5 to vote on and approve the recommendation of the directors. At the same time it was disclosed that the directors had voted to increase the present 75-cents-per-share to 78¾ cents plus a 2 per cent stock dividend, all payable before the end of the year. The proposed stock split would become effective December 30. The decision came at a time when the current price of International common stock was 2 below $90, a figure not touched since 1958 until a few weeks ago. The stock had sold at over $141 in 1959 and over $136 earlier this year. The announcement immediately caused a flurry in the market and the price of the stock rose immediately on publication of the proposal.

Stock and Bond Quotations

Closing Prices	October 10, 1960	September 9, 1960
New York Stock Exchange — Stocks		
American Can	34	38¼
Same Pref	36⅛	37⅝
Celotex	21½	23½
Same Pref	*17½-18	*173¾-18¾
Certain-Teed	11⅛	12⅝
Champion P & F	27⅜	29
Same Pref	—	*92-93½
Container	21⅜	222 1.8
Same Pref	*93-95	*90½-92
Chesapeake of Va.	34	35¼
Continental Can	35½	37⅜
Same Pref	79	79½
Crown Zellerbach	43	48⅞
Same Pref	*92⅛-95	94
Diamond National	34½	36½
Same Pref	*30¼-30½	30½
Federal Paperboard	34	35⅝
Same Pref	*22¾-23	22
Fibre Paper Board	27¾	29¼
Great Northern	39	42⅛
Hammermill	*29-29½	30½
International	88⅞	92½
Same Pref	*92¼-94	92½
Kimberly-Clark	80⅜	79⅜
KVP Sutherland	26⅜	30
McAndrews & Forbes	28	*28½-29
Masonite	27⅜	29
Mead Corp.	34⅜	33⅜
Same Pref	*86-87⅜	*86½-88
Minn. & Ont.	29½	37
Nat. Vulc. Fib.	21	22½
Oxford Paper	24	26⅞
Same Pref	*89¼-91	*91⅛-93
Rayonier	16⅛	18¼
Riegel Paper	*27-27½	30¼
St. Regis	31¾	35⅞
Same Pref	*92-95	*92-96
Scott Paper	87¾	86⅝
Same $4 Pref	*85-87	*89-92
Same $3.40 Pref	*77¼-78	*76-76⅞
Sealright	32½	32¼
Standard Packaging	23⅞	28⅜
Same $1.60 Pref	70	*92-96
Same $1.20 Pref	*30-30¼	34½
Same 6% Pref	29¾	33⅝
Union Bag-Camp	30	31¾
United Bd. & Cart.	20⅜	*22-22⅝
U.S. Gypsum.	92	96¼
Same Pref	155	156
West Va. P. & P.	35¾	38¾
Same Pref	*96-97½	*96½-97
New York Stock Exchange — Bonds		
Champion P & F Co 4½%	104½	107½
Champion P & F Co 3¾%	91¼	88
Diamond Gardner 4%	—	91¾
Kimberly-Clark 3%	92⅝	91¼
Oxford 4¾%	104	105¼
Scott 3%	113¾	111½
American Stock Exchange		
Allied Paper	11⅜	13½
American Writing	31	30¾
Brown Co.	13¾	13¾
Puget Sound	20¼	22½

*Closing Bid and Asked Prices



The Squeeze Is on FOAM

with Dow Corning Silicone Defoamers*

There's a *right* tool for every job. In foam control it's Dow Corning silicone antifoamers or defoamers . . . job-proved thousands of times over as the most efficient, most economical, and most versatile foam suppressors available.

*At prescribed levels, are sanctioned by FDA

FREE SAMPLE and new manual on foam control

first in silicones

Dow Corning CORPORATION
MIDLAND, MICHIGAN

Dept. 6711

Please rush a FREE SAMPLE of a Dow Corning silicone defoamer for my product or process, which is (indicate if food, aqueous, oil or other): _____

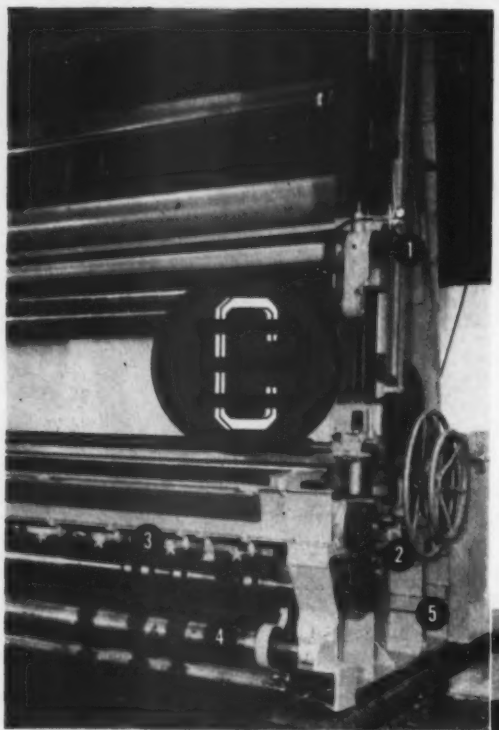
NAME _____

POSITION _____

COMPANY _____

ADDRESS _____

For more data circle 123 on Post Card



TD-12

th[illegible]od[illegible]st[illegible]er-wi[illegible]s

- Air-operated automatic riding roll pressure relief eliminates use of loose counterweights and oil hydraulic systems
- Tooth belt main drive and rear shear drive . . . no lubrication . . . minimum maintenance
- Readily adjustable bow spreader bar complete with variable pressure points
- Pneumatic operated double shaft front shear support . . . all front shears engaged and disengaged from operator's control station
- Heavy framing for vibration dampening and rigidity

Standard, readily available commercial parts

Write for Bulletin 23-DM for specifications of a full range of types and sizes.

THE BLACK-CLAWSON COMPANY
Dilts Division, Fulton, N. Y.

TD-12 in operation at Newton Falls Paper Mill, Newton Falls, N. Y.

Convert with Confidence

[illegible]

For more data circle 124 on Post Card

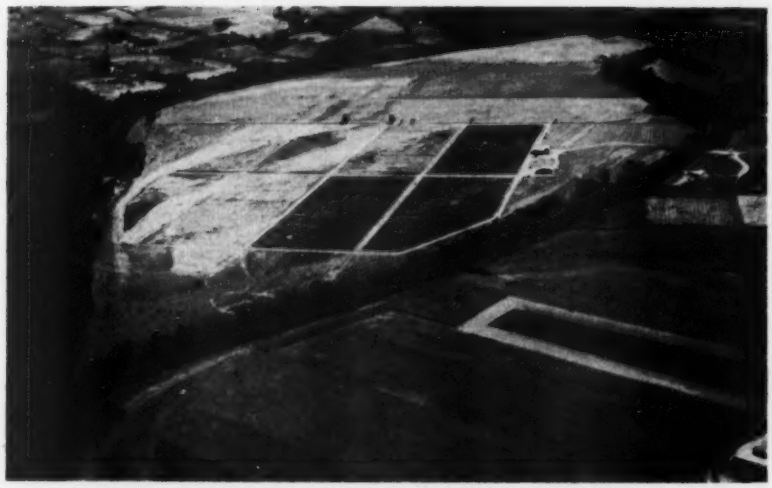
NEWS of the INDUSTRY

Tennessee Dedicates First Industrial Tree Seedling Nursery

Governor Buford Ellington of Tennessee, recently dedicated his state's first industrial tree seedling nursery in Rose Island, Tenn. At the same time, he saluted the event as the largest industrial forest development program in the history of Tennessee.

The dedication ceremony took place at the site of the Rose Island pine seedling nursery of Bowaters Southern Paper Corp. — located on a 120-acre island in the middle of the Little Tennessee River near Vonore, Tenn.

Only four years ago, this area was a sleepy island growing agricultural crops. Today, well over 20 million pine seedlings of various species are grown each year and has developed the island into a highly productive outdoor pine "factory." This was done by the Bowaters Southern Paper Corp.'s woods organization, the Hiwassee Land Co. A 30-acre pine orchard, devoted to developing improved species of seed-bearing pines, is also located on the island.



Aerial view of the Rose Island Nursery of Bowaters Southern Paper Corp.

Jim Hill, reforestation superintendent for Hiwassee Land Co., directs the overall tree-growing and planting program at the Rose Island Nursery. Hill is assisted by Bob Dorward, nurseryman, and Bill Keithley, assistant nurseryman. Other permanent personnel include Richard Griffith; Henderson King; Charles West and Cory Millsaps. During the planting and lifting seasons at the nursery, some 30 to 35 temporary laborers are also employed.

Bill Keithley, assistant nurseryman, grafts a cutting in the tree orchard.

A young pine seedling is examined by Jim Hill (left), reforestation superintendent, and Bob Dorward (right), nurseryman.

Two Research Firms Join Together to Speed Food and Drug Compliance

Tracerlab Inc. of Waltham, Mass. and Industrial Biology Laboratories of Philadelphia, Penn., have joined together in an effort to assist American industry in gaining approval for the use of food additives and packaging materials required by new Food & Drug Administration Regulations.

By contacting either I.B.L. or Tracerlab, a company can obtain all of the following services from a single source: (1) Analysis of the problem by I.B.L. and an outline of methods and techniques that are most likely to be acceptable to the F.D.A.; (2) Synthesis of radioactive materials required for tracer techniques by Tracerlab.; (3) Administration of the compound to test animals by I.B.L.; (4) Part per million and part per billion radio-chemical essay of samples and metabolic by-products by Tracerlab; (5) Observation of test animals throughout the life of the program by

I.B.L.; (6) Preparation of necessary official petitions by I.B.L.; (7) Liaison with, and personal representation to, the Food & Drug Administration by I.B.L.

Buckeye Reports New Findings on Viscose Process

New knowledge concerning the effect of non-cellulosic materials on the viscose process has been revealed by the research department at Buckeye Cellulose Corp.

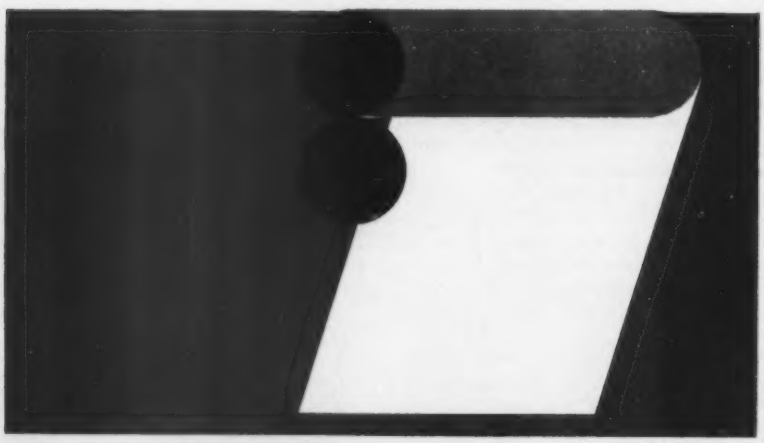
Miss Marie Easterwood, a research chemist at Buckeye, reported these findings at the 138th national meeting of the American Chemical Society.

The new findings concern the effect of various non-cellulosic materials on the ripening stage of the viscose process. Among the materials studied are the by-products of xanthate formation and trace components normally present in the reagents used in the viscose process. Greater knowledge of the effect of these materials could lead to improved products by permitting closer control over biscose ripening. Miss Easterwood pointed out that closer control would be advantageous because of the effect of ripening upon the solution properties and coagulation characteristics of viscose.

CIBA Direct Pure Blue P-2BR Conc.

The New Low-Cost Way to Brighter White

on
Bleached sulphite
Bleached Kraft
Tissue grades
Water-leaf
and stocks containing groundwood



Save substantially on your next run of white paper grades by using CIBA Direct Pure Blue P-2BR Conc. Recent mill runs with this unique dye have resulted in savings up to 100% over pigment blues. Reproducible brighter whites are now assured because Direct Pure Blue P-2BR Conc. offers rapid development and direct affinity for the fibers. In addition, this new CIBA dye provides fastness properties, when used as a tint, equivalent to the pigment blues. Your inquiries are invited on CIBA "Paper Proved" Dyes; technical information and samples are available on request. CIBA Company Inc., Paper Chemicals Dept., Fair Lawn, New Jersey.

CIBA

For more data circle 125 on Post Card

Forestry Notes

The agriculture department has announced that the timber cut in national forests for the fiscal year 1960, totaled a record of 9.3 billion board feet. This was valued at about $148 million. The 1959 cut was 8.3 billion board feet with a value of $114 million. It was also reported that more timber was sold in 1960. This was an increase of 30 per cent over 1959.

• • •

It has been reported that the Soviet forestry research institute has developed a machine which can plant trees up to 13 ft. tall at the rate of 350 per hour. The machine is operated by two men. This machine is coupled with a large crawler tractor. It can gouge a trench, plant trees at regular intervals and cover them with earth.

• • •

William H. Chisholm, president of Oxford Paper Co., has announced that the company has sold timberlands to the Province of Nova Scotia for about $3,750,000. There were 396,000 acres of leasehold and 12,000 acres of freehold timberlands at Cape Breton, Nova Scotia included in the sale. The cash received from the sale will be used in the company's kraft paper program which is due for completion in 1962.

• • •

Richard D. Lane, of the Washington, D.C., office of the Forest Service, USDA, will now be director of the Central States Forest Experiment Station. Lane will succeed William G. McGinnies, director of the station since 1953, who has retired after 30 years of government service.

• • •

Owens-Illinois Glass Co. is constructing a research and testing laboratory for its forest products group on Westwood Avenue, south of the O-I Technical Center in Toledo, Ohio. The lab is scheduled for completion late this summer. It will be designed to accomplish research and development for Owens-Illinois paper products, mill and multi-wall bag divisions, as well as the testing of the division's products — bringing together these functions for the first time.

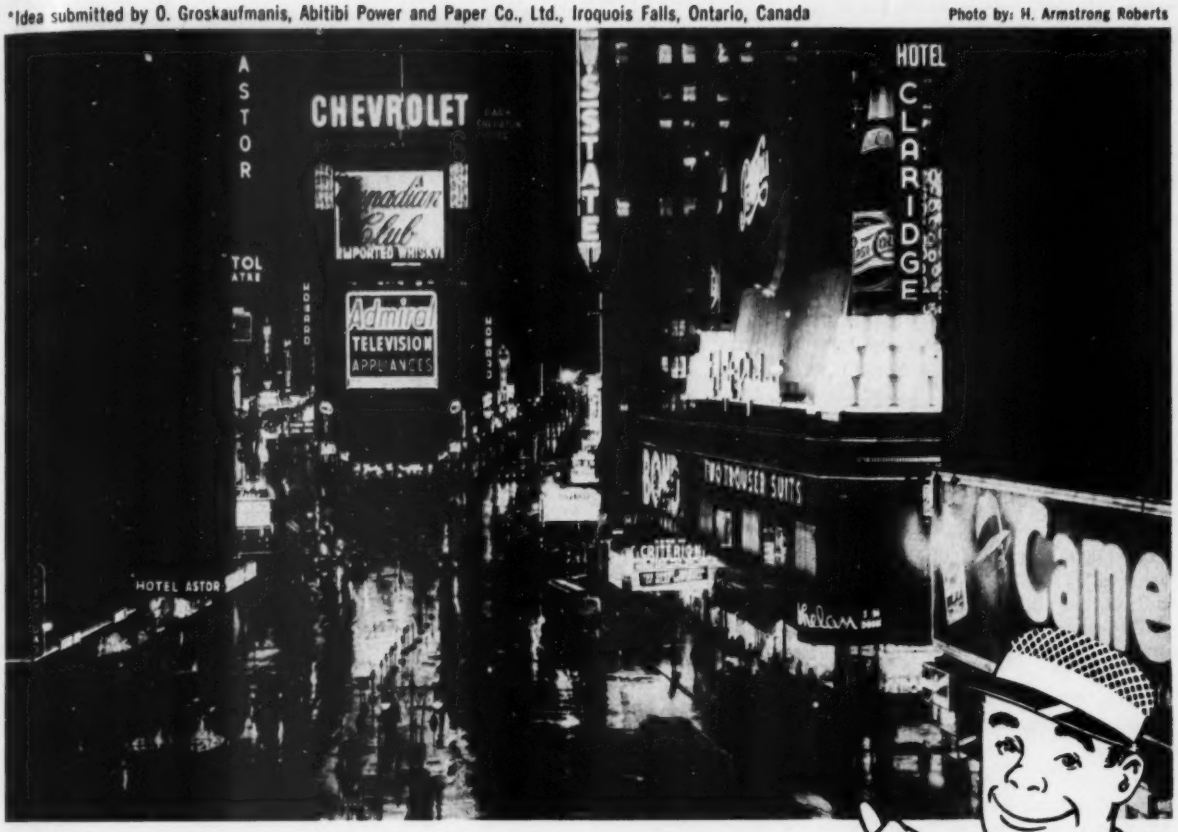
• • •

A grant has been awarded to the Institute for Agricultural and Forest Zoology of the University of Helsinki, Finland, for research to discover what substances in forest trees make them attractive to insect pests, the USDA has announced. The grant was awarded under a research program financed by foreign currencies accruing to the account of the U.S. from the sale of surplus agricultural commodi-

(Continued on page 598)

*Idea submitted by O. Groskaufmanis, Abitibi Power and Paper Co., Ltd., Iroquois Falls, Ontario, Canada

Photo by: H. Armstrong Roberts



"Reminds me of HAMILTON Felts . . . they stay open longer, too!"

"While it's important that a felt lasts a long time, it's also important that it doesn't get filled up with white water particles. And *Hamilton* Felts do stay open longer." writes O. Groskaufmanis, control engineer.

All Hamilton Felts are woven with plenty of open space between threads. The water flows through them almost as rapidly as it can be supplied.

But the fibers don't get through; they are caught by the long threads of the nap and removed by the metal shoes or washed off by jets of clean water.

If fast, copious water removal, economical fiber salvage, and long lasting, usable felts are what you want, why not start using us as one source of your felt supply? Just ask your Hamilton Felts Service Salesman . . . or write us, today!

*WIN . . . *A NEW Shakespeare Spincast Fishing Outfit!*

"What famous place reminds you of Hamilton Felts? Tell us why in a few words; sign your name and address and name of company. Each month, the idea from a papermaker that we use wins a new 1960 model Shakespeare Spincast Rod and Reel—FREE! When identical winning ideas are submitted by 2 or more papermakers, the one with the earliest postmark will be considered the winner. *Every U.S. papermaker entrant* receives a famous Rex Spoon fishing lure—FREE. Send me your suggestion—today. Ham Feltz, 612 First National Bank Bldg., Cincinnati 2, Ohio."

YOU CAN'T BEAT

Hamilton

FELTS

SHULER & BENNINGHOFEN, HAMILTON, OHIO

For more data circle 126 on Post Card

ties abroad under the Public Law 480. It will be administered by the foreign research and technical programs division of USDA's Agricultural Research Service.

• • •

A 16-page booklet entitled, "Operation Multiple Use — Program for the National Forests", is now being made available from Forest Service, U.S. Department of Agriculture, Washington 25, D.C. The booklet describes the accelerated program to develop all National Forest renewable resources to meet the increasing demands of an expanding population during the next 10 to 15 years. The program carries out the charge of Public Law 86-517 passed this year, directing that the National Forests be administered for multiple use and sustained yield. Specific National Forest projects needed to carry out the program are outlined.

Research League Steps Up Program

At a special meeting of the Sulphite Pulp Manufacturers' Research League executive committee, top executives of the pulp and paper industry decided that the sulfite liquor research for stream improvement will be stepped up by 17 per cent immediately.

Research budget of the League for the fiscal year starting August 1 was set at $185,465 — up more than $25,000 from actual expenditures of the past fiscal year. The increase provides for adding a technical assistant and a laboratory assistant to increase the effective efforts of research section chiefs in developing several promising new processes now under investigation in League laboratories and pilot plants.

The executive committee authorized, for use in the new budget, funds to be received from a voluntary assessment of $10,000 subscribed to the League by Consolidated Water Power & Paper Co. payable over a three-year period.

Howard Paper Celebrates 50 Years of Papermaking

Howard Paper Co. of Urbana, Ohio, (a division of Howard Paper Mills Inc.), celebrated the company's 50th anniversary on September 18.

Employees, retirees, and their families attended an open house celebration along with officers of Howard Paper Mills and the St. Regis Paper Co. (Howard became a subsidiary of St. Regis on June 29).

Left to right: Benton R. Cancell, executive vice president of St. Regis Paper Co.; William R. Adams, president of St. Regis Paper Co.; and John E. Minch, president of Howard Paper Mills Inc.

John E. Minch, president of Howard Paper Mills and William R. Adams, president of St. Regis, were principal speakers. Benton R. Cancell, executive vice president of St. Regis attended the open house along with the following Howard Paper Mills Inc. executives: K. P. Goehegan, vice president and technical director; J. H. Tate, vice president, manufacturing and engineering; B. W. Kimmel, controller; Harry A. Legge, executive assistant; H. H. Wegman, director of industrial and public relations; and C. M. Shockey, mill manager of the Urbana operations.

Production at Howard's Urbana plant began on April 10, 1910. The mill was opened by Colonel Maxwell Howard and his two brothers, Ward and Lucius. The plant was established in Urbana mainly because of the unlimited supply of cold, pure water and the accessibility to three major railroads.

Bonds, ledger and writing papers were the first products to be manufactured. The company has since added mimeograph and duplicating papers to the line. The volume of paper produced at the Urbana mill has gradually increased until it is now listed as 55 tons in 24 hours.

Recent Expansions in the Industry

Deinking Plant Under Construction in New Jersey

A $4,000,000 plant for the conversion of used newspapers into newsprint is expected to be in full operation at Garfield, N.J. by January, 1962.

The process, developed by Richard S. Scudder (publisher of The Newark News) and Robert Illingworth (an engineer of The News), uses about 90 per cent waste paper and 10 per cent chemical fiber.

Garden State Paper Co., which is controlled by The News, will run this operation. Production will be 45,000 tons a year with a potential of 80,000 tons.

The site of the new plant is on ten acres along the Passaic River, between Lanza Avenue and the East Paterson line.

Menasha Features Black-Clawson Equipment at North Bend

Menasha Wooden Ware Corp. has awarded contracts to the Black-Clawson Co. for the construction of the principal items of equipment to be installed in the new Menasha Pulp & Paper Division mill now under construction at North Bend, Ore.

Pulping and paper-making machines from three Black-Clawson divisions will equip the mill for integrated production of 125 tons per day of .009 corrugating medium from Douglas fir and Western hardwoods.

For neutral sulfite semi-chemical pulping of the wood chips, the Pandia Division is supplying a two-tube Pandia continuous digester system including screw feeder and continuous discharger. The mill's wood supply will consist of approximately 75 per cent alder and 25 per cent fir chips from the lumber and plywood plant operated by Menasha Wooden Ware in the North Bend area.

Defibering and refining of the pulp will be accomplished in three, 48-in., B/C Sutherland high consistency refiners and two, 48-in., Model "B" B/C Sutherland pump-through refiners, built by the Shartle Division of Black-Clawson. Shartle is also furnishing two, No. 24-P Selectifier screens and a paper machine broke pulper for the paper mill.

Paper will be produced on a 176-

in.-wide Hydroflyte cantilevered fourdrinier machine built by the Paper Machine Division of Black-Clawson. Components include: a pressure headbox; two straight-through suction presses; 30, 60-in. dryers and six felt dryers with an enclosed gearing; a three-roll, open-side calender stack; an Autoflyte reel; and a Model 180 Black-Clawson winder. The machine design provides for simple expansion to a production capacity of 200 tons per day.

E. C. Manders, manager of the Menasha Pulp & Paper Division, reports that the mill will be completed in production by June 1961.

Sutorbilt Appoints New Sales Representative

Jobe & Co. of Baltimore, Md., has been appointed by Sutorbilt Corp. as a representative for sales engineering and customer service.

The Jobe firm will be responsible for activities in Maryland and Virginia. This firm also maintains a branch in Richmond, Va. It handles compressors, valves, air dryers and general industrial equipment.

Packing Corp. Acquires California Plant

Packaging Corp. of America, Evanston, Ill., has purchased a 300,000-sq.-ft. plant (formerly owned by H. J. Heinz & Co.) in Berkeley, Calif. This will be the company's first manufacturing operation in the west coast market area.

The new plant will manufacture molded pulp egg cartons, plates and trays, vegetable and fruit trays, and other molded pulp egg packaging matials. Operations in the Berkeley plant will begin late in 1961, but full production will not be reached until later. The company plans to install several million dollars worth of specialized molding units and other equipment in its new plant.

Cochrane Corp. Opens Branch Office

Cochrane Corp., Philadelphia, announces the opening of its Minneapolis branch office. This new office will serve the Minnesota, N. Dakota, S. Dakota and Wisconsin area.

New Plant to Make "Scottfoam"

Scott Paper Co. has announced that it will invest over $3,000,000 in an expansion program to increase the company's output of plastic drinking cups and for "Scott-foam".

Scheduled for completion in early 1961, the new plant will cover about six acres of land fronting on the Delaware River in Eddyston, Pa.

"Scottfoam" and plastic cups are now being made in rented space inadequate to produce the volume necessary to meet demand.

Construction Crews Begin Work on Consolidated's Expansion Program

Consolidated Water Power & Paper Co.'s Wisconsin River Division has started excavation for a multi-million-dollar expansion program. Construction crews are now moving earth in preparation for laying of footings on the 432-ft. by 66-ft. building which will house a new paper machine. Plans originally called for completion in January of 1960. Revised delivery schedules are expected to permit start-up during September of next year.

The new paper machine will produce 25,000 tons of enamel printing papers annually. When completed, the company will have 11 paper-making units of this type devoted exclusively

Investing in a

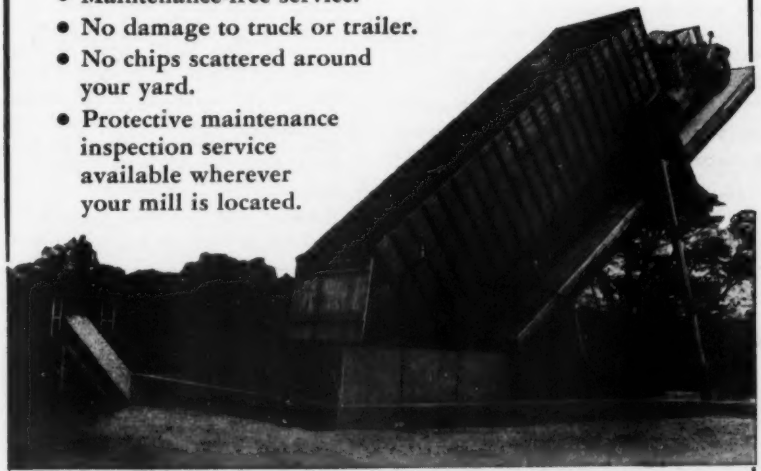
Kewanee HYDRAULIC TRUCK DUMPER

. . . is Like Putting Money in the Bank!

WHY? Because unloading wood chips via a "Kewanee" is the most logical way to handle them! A "Kewanee" will simplify and systemize your operations—and, start earning money for you the moment it is installed and running!

Here are a few of many more reasons:

- You get a dumper of good, sound engineering, backed by over 40 years of dumper building experience.
- Simple, safe operation, with only one man needed at the controls.
- Maintenance-free service.
- No damage to truck or trailer.
- No chips scattered around your yard.
- Protective maintenance inspection service available wherever your mill is located.



Above photo shows a 45 ft. "Kewanee" unloading chips into a yard hopper from which they are conveyed by belt to mill storage and/or to digesters. "Kewanee's" are available to suit your conditions, in sizes up to 70 ft., with a 50° angle of tilt. Unloading of any size truck or tractor-trailer is accomplished in a few minutes. Scale-type dumpers are also available.

write for full specifications

SCREW CONVEYOR CORPORATION

709 Hoffman Street, Hammond, Ind.

Southern Plant, Winnona, Mississippi | West Coast Plant, Santa Clara, Calif.

Branch Offices

Dallas, Texas | Memphis, Tenn.
Hackensack, N. J. | Tampa, Florida

For more data circle 127 on Post Card

For more data circle 128 on Post Card

News of the Industry . . .

to the manufacture of enamel papers with an annual capacity of over 300,000 tons.

Auxiliary facilities are also necessary to the start-up of this new machine. Scheduled for enlargement are: Wisconsin River Division's boilerhouse, groundwood pulp and bleach departments, coating plant, finishing facilities and stores. Chemical pulp requirements will be met by the company's other plants.

New Morningstar-Paisley Plant

Morningstar-Paisley Inc. has begun production on a complete line of industrial adhesives at their new plant in Atlanta, Ga. The new plant will also serve as a warehousing and service facility for other products.

Flo-Tronics Opens New Research Laboratory

Flo-Tronics of Minneapolis, Minn. has designed a new research laboratory for testing air conveying systems. The laboratory will allow engineers and potential customers to test and evaluate materials handling problems with any type of material. Engineers of the chemical, food, milling and processing industries will find it of particular interest.

KVP Installs New Kraft Machine

A new, 226-ft.-long kraft specialty paper machine has been installed by the Espanola, Ontario, firm of KVP Co. Ltd. (an associated company of KVP Sutherland Paper Co. of Kalamazoo, Mich.).

The installation of this machine also completes a 2.5 million-dollar expansion program for the company.

Daily operating capacity of this machine is 65 tons of paper, from 15 to 50 lb. basis weight. It can produce machine finish or machine glaze, with or without special surface treatments. This unit is the third paper machine for the mill which produces kraft pulps for conversion by KVP Sutherland plants in the United States and Canada. In addition, the Espanola mill produces paper for Canadian consumption.

Another new operation in the KVP mill is the recovery of tall oil from its sulfate pulping process. The by-product is being processed for use by Hercules Powder Co. of Burlington, Ontario.

R. T. Vanderbilt Co. Moves Office

As of October 24, the R. T. Vanderbilt Co. have moved their Kalamazoo office to 218 West Walnut St. The telephone number will remain the same: Fireside 2-5749. The office will be under the direction of Robert W. Shaw.

Rome Kraft To Install Waste Treatment System

Rome Kraft Co. of Rome, Ga., is now constructing a new waste treatment system. While the mill's production capacity will be increased, the new waste treatment system being installed will reduce the quantity of waste materials discharged into the Coosa River.

The new system is a result of a two-year pilot plant study conducted at the mill under the immediate supervision of McDewain Sandlin, chief chemist at Rome Kraft, in conjunction with Virgil Minch, of Mead Research Laboratories. It will incorpo-

Custom

Stainless Steel Fabrication For The Pulp-Paper Industry

(Quotations Promptly Forward)

Specialists In All Phases Of Corrosion Resisting Alloy Fabrication

Portland Copper And Tank Works, Inc.

80 Second St., South Portland, Me.

For more data circle 129 on Post Card

rate the latest design features and is said to be the first large-scale installation of its kind. It is believed to be a significant improvement over processes now in use in the industry.

While the cost of research, development, construction and installation of the waste treatment system represents a substantial expenditure, and while the reduction in the waste discharged to the Coosa River is a major step in the company's pollution abatement program; it is recognized that there will continue to be waste material discharged in the mill's effluent.

Warren Pumps Expands Test Facilities

Warren Pumps Inc. of Warren, Mass., has just completed work on an expansion of pump test facilities, both production and experimental. The capacities of both the centrifugal pump and the rotary pump test departments have been doubled by the completion of the project. An immediate result of the expansion program has been improved customer service in the form of shorter deliveries.

Permutit-U B S Chemical Venture For Overseas Production

A joint venture for production and distribution of UBATOL brand polymer emulsions is planned by U B S Chemical Co. of Cambridge, Mass. (a division of A. E. Staley Mfg. Co., Decatur, Ill.) and Permutit Co. Ltd., London. The synthetic polymer products will be produced at Permutit's chemical works in Ponty Clun, Glamorgan, South Wales, for distribution to the floor polish industry throughout the United Kingdom and Europe. The joint venture for overseas production and distribution will cut freight costs, speed deliveries, and permit users to carry lower inventories.

Three Mills Install Appleton Winders

A 186-in. Appleton winder has been installed on the new No. 2 machine at the Nekoosa mill of Nekoosa Edwards Paper Co. The unit was designed to operate at speeds up to 5,000 fpm and is equipped with two, 100-hp Louis Allis motors. The winder will be used on grades and will wind and slit 60-in.-dia. rolls on 21-in. drums. Auxilliary equipment includes a 61-in.-dia. rider roll, pneumatically operated, score-cut slitters, a shaft puller, and a combination weighing and lowering table.

Ashuelot Paper Co. has installed a 100-in. (Model 65) Appleton rewinder at its Hinsdale mill. This unit will handle winding tissue and is powered by a 20-hp, Reliance single motor drive. Rolls up to 60-in. dia. will be wound and slit at speeds up to 2,000 fpm.

Hamilton Paper Co. has scheduled installation of a rewinder at its Plainwell, Mich., mill for late November. This unit is driven by two 40-hp, G.E.,motors and will operate at speeds up to 3,000 fpm. Rolls of various bond grades, 50-in.-dia., will be wound and slit (gang-type shear slitters) on 13½-in. drums.

Coming Events

TAPPI

February 19-23 — 46th Annual Meeting, Commodore Hotel, New York, N.Y.

PIMA

November 16 — Michigan Division (joint meeting with TAPPI), Hotel Harris, Kalamazoo, Mich.

December 1-3 — Pacific Coast Division (Annual Fall Meeting), Hotel Multinomah, Portland, Ore.

January 12 — Connecticut Valley Division (Winter Meeting), Publick House, Sturbridge, Mass.

January 19 — Michigan Division (Annual Papermakers Get-Together Party), Hotel Harris, Kalamazoo, Mich.

February 9 — Michigan Division, Hotel Harris, Kalamazoo, Mich.

OTHER MEETINGS

December 7 — National Association of Secondary Materials Industries, (Board of Directors), Commodore Hotel, New York, N.Y.

December 12-15 — Industrial Building Exposition & Congress, New York Coliseum.

January 23-26 — 12th Annual Plant Maintenance & Engineering Show, International Amphitheatre, Chicago, Ill.

January 24-27 — CPPA (Technical Section), Queen Elizabeth Hotel, Montreal.

January 26 — National Association of Secondary Materials Industries (Midwestern Division), Statler-Hilton Hotel, Detroit, Mich.

February 13-16 — 15th International Heating & Air-Conditioning Exposition, International Amphitheatre, Chicago, Ill.

Designers and Fabricators of air moving equipment for the paper industry

Movement of air is the universal paper mill problem. To produce the right flow that meets the needs of individual mills requires the experience and technical know-how of specialists in the design and fabrication of these systems.

Overly's engineers are always available to work with you from the early design stage of a complete air system to correcting any simple air moving problem. Why not write or phone today? We will gladly make recommendations and submit quotations without obligation, of course.

Serving the paper industry in custom metal fabrication of engineered air systems — machine hoods — Gardner Dryers—Westinghouse Sturdevant fans and steam coils — stock pipe — distributor rolls — suction boxes — white-water pans — head boxes — tanks.

OVERLY'S INCORPORATED

Box 468 Neenah Wisconsin

For more data circle 130 on Post Card

Lodding NO SPIT Steam Showers improve sheet quality

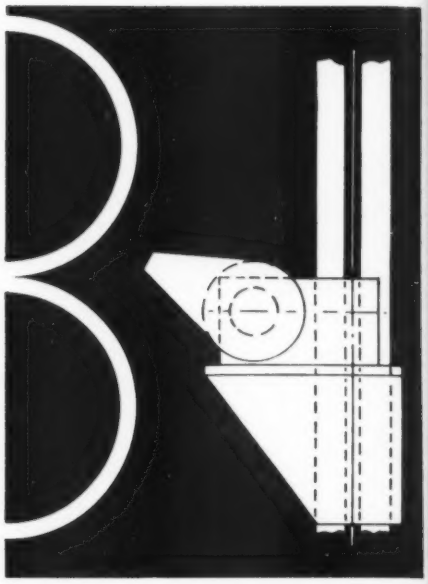
To papermakers who are anxious to improve sheet quality, Lodding *No Spit* Steam Showers are welcome aids. Mounted on super calenders or machine calenders, they distribute an even, controlled amount of dampness to the sheet without any troublesome "moisture drops" or condensation deposits. This leads to improvement in the pressing and finishing processes that make a better sheet.

The efficient pear shape design of Lodding Steam Showers allows positioning close to the nip (doubling as a nip guard) without obstructing the threading of the sheet. Showers can also be mounted farther away without impairing their performance, as steam may be forcefully ejected several feet beyond the aperture, even at pressures as low as 5 to 10 p.s.i. Adjustable bearings allow the showers to pivot out of the way while rolls are being changed.

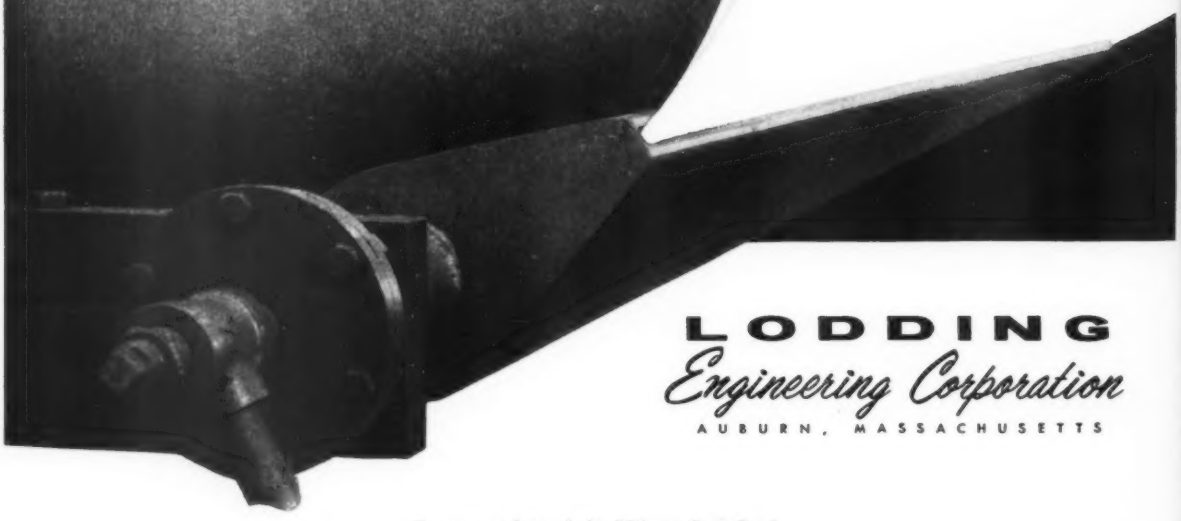
Regulated by valves located at each end of the shower, steam is directed across the full width of the sheet or to either half as required.

Lodding *No Spit* Steam Showers are custom made to any length. They give years of trouble-free service with virtually no maintenance. Installation is simple. No heavy support brackets are required.

For more information get in touch with Lodding or your nearest Lodding sales representative.



Conveniently mounted on calenders for maximum efficiency



LODDING
Engineering Corporation
AUBURN, MASSACHUSETTS

For more data circle 131 on Post Card

RY

NAMES in the NEWS

Dr. Strauss

R. A. Petry

Nekoosa-Edwards Paper Co.

Robert A. Petry has been named manager of the woodlands department for the company. Petry has been assistant manager of the department since 1954, and succeeds F. George Kilp.

Dr. Roger W. Strauss, former faculty member of the New York State College of Forestry, Syracuse, has joined the research department of the company as a section leader for chemical and physical research. Previously with Hammermill Paper Co., he has been an instructor of pulp and papermaking for the past five years.

Bemis Bros. Bag Co.

Charles E. Hinman has been named resident manager of the company's paper specialty plant in Fullerton, Calif. Hinman has been a sales representative for Bemis since 1954. The Fullerton plant produces paper specialty items including insulation bags, outdoor storage covers and large industrial bags.

S. M. Spencer has been appointed manager of the St. Louis bag plant and sales division. He replaces Philip C. McGrath.

S. D. Robey replaces Spencer at Omaha. Robey has been with Bemis since 1950 and was made sales manager for the company in Omaha in 1957.

Eastwood-Nealley Corp.

Robert M. Boring has been appointed sales and service representative for the sale of fourdrinier wires, paper mill wire cloth and related products, in the Middle Atlantic area. Formerly with Personal Products Corp., in Milltown, N. J. Boring succeeds Pat Daley, who was the Middle Atlantic area representative.

Henry J. Chandler, formerly with Continental Can Co.'s paper mill, has been appointed southwestern sales and service representative. He succeeds Curley Singletary.

Abitibi Power & Paper Co. Ltd.

T. Newman McLenaghen has been promoted to mill manager for the Manitoba Paper Co. Ltd. of Pine Falls, Manitoba. He was formerly assistant mill manager of the Pine Falls Division. He will succeed R. L. Fraser who is on special assignment at Abitibi's Iroquois Falls Division.

J. H. Tremblay has been named assistant mill manager at the Manitoba Paper Co. Ltd. He was formerly general superintendent of the mill and has been associated with Abitibi for over 45 years.

J. F. Williams, has been named general superintendent at Manitoba Paper Co. Ltd. He was formerly resident engineer at Abitibi's Iroquois Falls Division.

D. D. Monro has been promoted to resident engineer at the Iroquois Falls Division. He was formerly resident engineer at the Manitoba Paper Co. Ltd.

W. C. E. Wood will become resident engineer at Manitoba Paper Co. Ltd. He was formerly engineering and maintenance superintendent at Abitibi Corp. at Alpena, Mich.

Albemarle Paper Mfg. Co.

Arthur W. Hines has been elected to the position of vice president in charge of manufacturing, and a director of the company. Hines has been with Albermarle since 1931.

Huyck Felt Co.

John E. Wilbur has been named to assistant manager of field service engineering. He previously served as a Huyck sales and field service engineer.

John G. Casagrande has been named to succeed Wilbur as field service engineer for portions of New Jersey, Pennsylvania, Maryland, Delaware and North Carolina.

Leonard R. Lefkowitz has been appointed as physical scientist. He has been associated with the textile industry for 10 years and most recently worked on wool processing for the Western Regional Research & Development Division of the U.S. Department of Agriculture.

A. H. Krause, formerly chief engineer, has been appointed project manager.

Sam C. Hart has been appointed manager of sales. He had been a project manager.

M. G. De Shazo Jr. has been appointed project manager.

Francis L. McKone is now research engineer in the company's felt development department. He will be concerned with developing new weaves in constructions as well as the modified use of synthetic fibers to improve a wide variety of papermakers' felts.

F. McKone

J. Wilbur

L. Lefkowitz

J. Casagrande

West Virginia Pulp & Paper Co.

Shelton J. Jones has been appointed manager of the company's St. Louis plant. Formerly plant produc-

tion manager, Jones succeeds Allen G. Woodruff who resigned. The St. Louis plant manufactures multiwall bags using both kraft and Culpak extensible papers.

Aetna Paper Co.

Robert M. Brown has been appointed as superintendent. He will replace W. Clare Monaghan, who served this position for six years until his death on June 30. Brown joined the company in 1954 as a mill chemist and was appointed assistant superintendent in 1957. Earlier this year, he was given added responsibility as safety supervisor of the division.

Perkins-Goodwin Co.

John F. Rousseau has joined the company to serve as general account executive, working out of the company's New York headquarters, and will be active in pulp and paper sales.

His industry activities include a term as vice president of the Ground Wood Paper Manufacturers Association and membership on the executive committee of the Printing Paper Manufacturers Association.

NO WRINKLES
NO Hard or Soft Spots at the Winder with...
RMF hydroscillators
This simple, compact oscillating unit provides a constant horizontal shifting motion while the sheet is being wound into a roll. This back and forth movement prevents wrinkles from "tracking" and building up throughout the roll. No more wrinkles, no more hard and soft spots!
Check your finishing room...our RMF Hydroscillators will give you a higher percentage of salable paper. For more information send for Bulletin No. 101.
ROSS MIDWEST FULTON
A Division of Midland-Ross Corporation
Box 846, Dayton, Ohio
For more data circle 132 on Post Card

Western Michigan University

John M. Johnson is the first full-time machine tender for the Lou Calder laboratory model paper fourdrinier at the University. The position was made possible through the efforts of the Paper Technology Foundation. Working with Dr. John Fanselow, associate professor of paper technology, Johnson will get the machine in full operating condition, enabling it to make grades from tissue to board.

Necrology . . .

Mark M. Biddison

Mark M. Biddison, former president of Allied Chemical's General Chemical Division, died at Sarasota, Fla., where he lived since his retirement in 1957. Biddison had been with General Chemical for 39 years, and was president from 1952 to 1957.

William H. Mordo and N. Warren Hess

William H. Mordo was killed when an Electra jet-prop crashed into Boston Harbor. Mordo was technical service manager of Stowe-Woodward Inc., Newton Upper Falls, Mass.

N. Warren Hess, senior chemist for the firm was also killed in the same crash. Both were rubber roll specialists.

George A. LaHusen

George A. LaHusen, general safety supervisor for Crown Zellerbach Corp., was drowned while fishing near his summer home at Roche Harbor, Wash. LaHusen joined Crown Zellerbach 27 years ago, and has since served as assistant personnel and safety supervisor, the West Linn personnel supervisor, and general safety super-

gdc dyes for paper—a complete color spectrum and whiter "whites"

	APPLICATION: Beater	Calender	Coating	CLASS: Basic	Acid	Direct	Pigment
YELLOW							
Auramine	•	•		•			
Brilliant Pure Yellow	•				•		
Chinoline Yellow	•	•	•		•		
Chrome Yellow	•		•				•
Chrysophenine	•					•	
Direct Yellows	•		•			•	
Fast Light Yellow		•	•		•		
Fastusol® Yellows	•		•			•	
Hansa® Yellow	•		•				•
Metanil Yellow	•	•			•		
Oxide Yellow	•		•				•
Paper Yellow	•					•	
Permagen® Yellow	•		•				•
Stilbene Yellows	•					•	
Tartrazine		•			•		
ORANGE							
Acid Orange	•	•	•		•		
Benzo Fast Oranges	•		•			•	
Chrysoidines	•			•			
Direct Fast Oranges	•		•			•	
Fast Light Orange		•			•		
Fastusol Oranges	•		•			•	
Orange	•	•	•		•		
Permanent Orange	•		•				•
Paper Orange	•					•	
BROWN							
Benzo Brown	•					•	
Bismarck Browns	•		•	•			
Fastusol Browns	•		•			•	
RED							
Benzo Bordeaux	•					•	
Benzo Fast Scarlets	•		•			•	
Benzo Rhoduline® Red	•		•			•	
Brilliant Croceine	•	•	•		•		
Direct Pink	•					•	
Direct Reds	•					•	
Fast Red	•				•		
Fastusol Pink	•		•			•	
Fastusol Reds	•		•			•	
Fastusol Scarlet	•		•			•	
Magenta	•	•	•	•			
Oxide Red	•		•				•
Paper Red	•				•		
Paper Scarlets	•					•	
Permagen Red	•		•				•
Permanent Carmine	•		•				•
Rhodamines	•	•	•	•			
Safranine	•	•	•	•			
Solar® Pink	•		•				•
Solcarbo® Pink	•		•			•	

	APPLICATION: Beater	Calender	Coating	CLASS: Basic	Acid	Direct	Pigment
VIOLET							
Brilliant Benzo Violet	•					•	
Crystal Violet	•	•		•			
Ethyl Violet	•	•		•			
Fastusol Violets	•					•	
Formyl Violet	•	•			•		
Methyl Violet	•	•		•			
Solar Coating Violet			•				•
Solar Violet	•		•				•
BLUE							
Benzo Azurine	•		•			•	
Benzo Blues	•		•			•	
Benzo Sky Blue	•		•			•	
Brilliant Benzo Blue	•		•			•	
Brilliant Wool Blue		•			•		
Fast Bond® Blues	•				•		
Fastusol Blue	•		•			•	
Fastusol Turquoise Blue	•		•			•	
Heliogen® Blues	•		•				•
Methylene Blue	•	•	•	•			
Neptune® Blues		•	•		•		
Paper Pure Blue	•	•	•	•			
Rhoduline Blues	•	•		•			
Solar Blues	•		•				•
Solar Coating Blue			•				•
Solcarbo Blues	•		•			•	
Soluble Blues	•				•		•
Victoria Blue	•	•	•	•			
Victoria Pure Blue	•	•	•	•			
GREEN							
Benzo Greens	•					•	
Brilliant Green	•	•	•	•			
Fast Bond Green	•				•		
Fastusol Greens	•					•	
Guinea Green	•	•	•		•		
Heliogen Greens	•		•				•
Heliogen Viridines	•		•				•
Naphthol Green		•	•		•		
Neptune Green	•	•	•		•		
Pigment Green	•		•				•
Solar Green	•		•				•
Victoria Green	•	•	•	•			
BLACK							
Acid Black		•			•		
Basic Black	•	•		•			
Diamine Black	•		•			•	
Diazo Black	•		•			•	
Direct Deep Black	•		•			•	
Fastusol Greys	•		•			•	
Naphthylamine Black	•	•	•		•		
Nigrosines	•		•			•	
Permanent Black	•		•				•

Partial list of colors and types available from GDC

GDC, as a major supplier of dyes for the paper industry, offers the newest colors available in the widest variety of forms. In this manner we are able to satisfy all individual requirements. Write direct for complete information and samples or call the GDC service representative nearest you.

FROM RESEARCH TO REALITY

GENERAL DYESTUFF COMPANY

A SALES DIVISION OF

GENERAL ANILINE & FILM CORPORATION

435 HUDSON STREET • NEW YORK 14, NEW YORK

CHARLOTTE • CHATTANOOGA • CHICAGO • LOS ANGELES • NEW YORK • PHILADELPHIA • PORTLAND, ORE. • PROVIDENCE • SAN FRANCISCO • IN CANADA: CHEMICAL DEVELOPMENTS OF CANADA LTD., MONTREAL

For more data circle 133 on Post Card

WISCONSIN WIRE WORKS
APPLETON • WISCONSIN

For more data circle 134 on Post Card

Necrology . . .

visor for the corporation's headquarters in Portland.

Carlile P. Winslow

Carlile P. Winslow, one of the founders of the U. S. Forest Products Laboratory, died in Washington, D.C. Winslow joined the Forest Service of the U. S. Department of Agriculture in 1908, and became assistant director in 1912.

George S. Smith

George S. Smith, vice president and director — engineering of the Johns-Manville Corp., died in North Plainfield, N. J. Smith started with the company as a plant engineer in 1929 and held various executive engineering posts before being named in 1954 to the position he held at death.

John G. Rote Jr.

John G. Rote Jr., director of research and development for Standard Packaging Corp., New York, was killed in a plane crash near Hamlin, W. Va. Company officials said Rote was on a business trip to Louisville, Ky.

Edward P. Escher

Edward P. Escher, vice president and director of Screw Conveyor Corp., Hammond, Ind. and Winona, Miss., died October 10 at Flossmore, Ill. A former chairman of the Screw Conveyor Section of the Conveyor Equipment Manufacturers Association, he was active on various committees contributing to the development of American Standards, Conveyor Terms and Definitions, Safety Code for Conveyors and related equipment.

George O. Trudeau

George O. Trudeau, sales engineer for Holyoke Machine Co., Holyoke, Mass., died October 10. Trudeau was a member of both TAPPI and PIMA.

Joseph Y. Baruh

Joseph Y. Baruh, recently named director emeritus of Crown Zellerbach Corp., San Francisco, Cal., died October 20. Baruh had been a director of the corporation since 1924 and was one of the original directors of Zellerbach Paper Co.

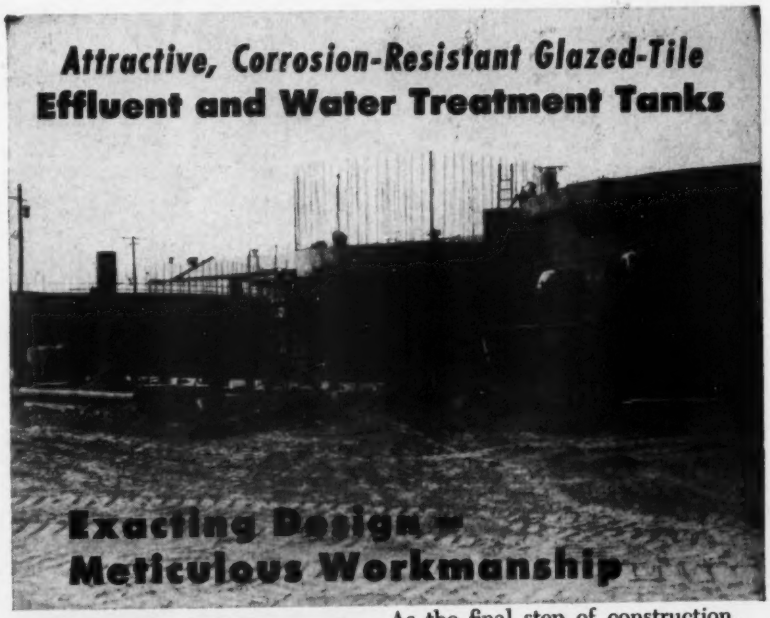
William G. Reekie

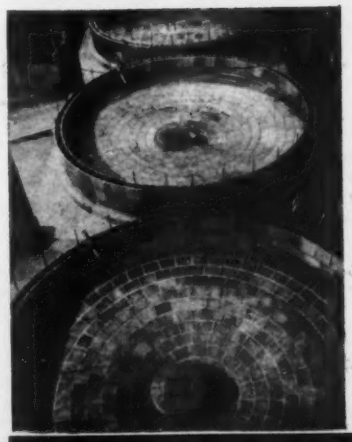
William G. Reekie was a pioneer in the paper industry in Canada and manager of engineering for Abitibi Power & Paper Co. Ltd., Toronto. Reekie went to work in the Ft. William Division of Abitibi, and later served the Manitoba Paper Co., Murray Bay Paper Co., Manitoba Power Commission and the Ontario Paper Co.

George K. Gibson

George K. Gibson, former sales manager of Mosinee Paper Mills Co., Mosinee, Wis., and a pioneer in modern sales techniques in the paper industry, died Oct. 6 in Orlando, Fla., where he had lived since retirement in 1949.

Gibson, a former resident of Evanston, Ill., was born in Wisconsin Rapids, Wis., and became widely known in the paper industry. In 1920, he organized and became the first president of the Salesmen's Association of the Paper Industry. Before his retirement he was a lay leader and one-time superintendent of St. Luke's Episcopal Church, Evanston. His son, George B., is managing director of the Fourdrinier Kraft Board Institute Inc., New York, N. Y.





As the final step of construction, Stebbins workmen carefully wash down the exterior of the tanks with acid.

In this view of tank floors under construction, note the clean, smooth joints — the mark of good workmanship. Note the variety of tile shapes. Horizontal and vertical steel reinforcing is shown in the walls which will be solidly filled with concrete as work progresses.

Complete Service — Design, Installation, Maintenance

WRITE FOR BULLETIN AET-59

SEMCO

STEBBINS Engineering and Manufacturing Company

WATERTOWN, N. Y. • PENSACOLA, FLORIDA

STEBBINS ENGINEERING CORP. — 2611 MARKET ST. SEATTLE 7, WASH.

CANADIAN STEBBINS ENGINEERING & MANUFACTURING CO. LTD.

TOWN OF MOUNT ROYAL, MONTREAL 9 • MERCHANT EXCHANGE BLDG., VANCOUVER

SINCE 1884

For more data circle 135 on Post Card

SMIDTH
Rotary Kilns

For Reburning Lime Sludge

We are specialists in the design and manufacture of rotary kilns, coolers and auxiliary equipment for burning lime, lime sludge and for many other purposes.

Over 1,250 Smidth rotary kilns have been furnished all over the world.

F. L. SMIDTH & CO.
INCORPORATED
Rockefeller Center
1270 Avenue of the Americas
New York 20, N. Y.

F. L. Smidth & Co., A/S
77 Vigerslev Alle
Copenhagen, Denmark

F. L. Smidth & Co., Ltd.,
105, Piccadilly,
London, W. 1, England

F. L. Smidth & Cie France
80 Rue Taitbout
Paris (9e) France

F. L. Smidth & Co. (Bombay) Private Ltd.
42 Queen's Road
Bombay, India

F. L. Smidth & Co. of Canada, Ltd.
1270 Avenue of the Americas
New York 20, N. Y.

For more data circle 136 on Post Card

d.

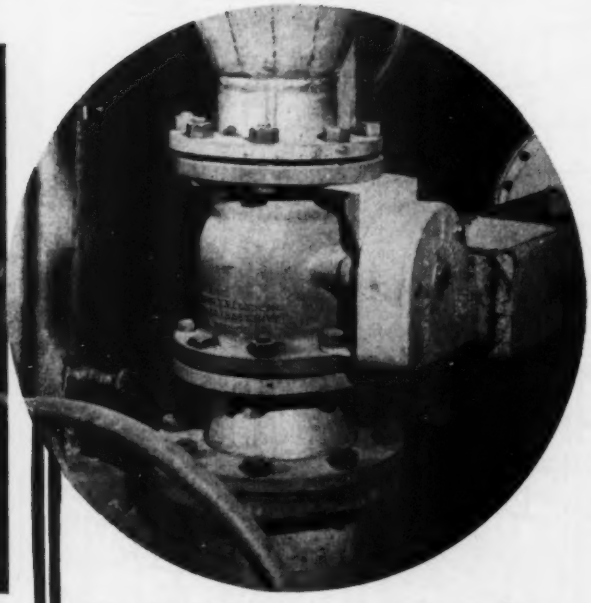
1960

jamesbury

"Double-Seal"™ BALL VALVES*

Most VERSATILE Valve In The Mill!

Jamesbury installation at Mead Corporation Chillicothe Plant



Jamesbury installation at Weyerhaeuser Longview Plant

As varied as the valving requirements are in pulp and paper processing, the Jamesbury "Double-Seal" Ball Valve is meeting them successfully. Jamesbury offers a functional, efficient, economical Ball Valve which has proved itself in performance in many major installations such as the examples shown above.

Jamesbury Ball Valve Versatility Is Proving Itself In These and Other Services

Spent Acid Lines • Sodium Dioxide • Calcium Hypochlorite CO_2 • Sampling Lines • Stock Lines • Bleach Lines • Liquor Lines H_2SO_4 • Black Liquor Recovery Service • Kraft Mill Digester Service • Chlorinated Stock Service • Brown Water SO_2 Service Instrumentation Lines • White Water • Water & Pulp Grinder Water in Filtration Plant • Digester Gas-Off • Digester Blow Service • Vacuum Service • Power Boiler • Gas Service General Caustic Service • Alum Lines • White Liquor Fill Vertrap Drain • General Air Service • Kaolin Clay Service • Paper Filler Service • Glue & Paste Service • Pilot Laboratory • Demineralizer Coating • Color Rooms • Paper Machine Showers • Hydrogen Peroxide • Rapid Cycle Digester Service • Hydrogen Gas Service • Boiler Water Treatment System • Ash Elimination Dry Chlorine Service • Starch System.

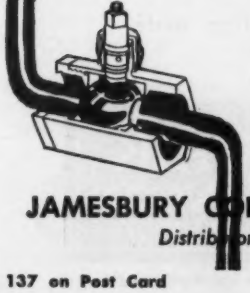
***Patented**

GREATEST RANGE OF BALL VALVE SIZES AND MATERIALS AVAILABLE.

Jamesbury "Double-Seal" Ball Valves are available in Types 303, 316 and Alloy 20 Stainless Steels, Carbon Steel, Bronze, Ductile Iron, Aluminum and PVC. Other materials on special order.

Interchangeable seats and seals are available in "Teflon", Nylon, Buna-N, Neoprene, Hypalon and natural rubbers.

Pneumatic, Hydraulic and Electric Motor Operators to fit Remote Control Requirements.



SIZES

Screwed End	¼" through 3"
Flanged	½" through 10" 150# and 300# series

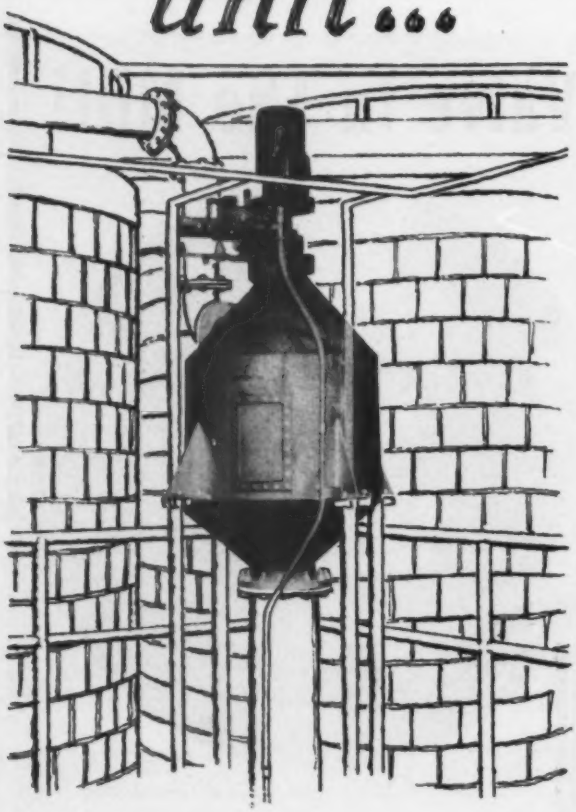
Send for Jamesbury's Pulp and Paper Brochure.

JAMESBURY CORP. NEW STREET, WORCESTER, MASS.
Distributors in Principal Cities

227-0

For more data circle 137 on Post Card

This one unit...



. . . this DeZurik Consistency Regulator . . . is the pulse of a mill. Its precise control guarantees accuracy within plus or minus .1% — even better on many installations! Its freedom from constant maintenance means less interruptions — more production. In short, it is constantly and consistently correct!

For more information, write

DeZURIK CORPORATION
SARTELL, MINNESOTA

For more data circle 138 on Post Card

FOREIGN ABSTRACTS

Semichemical pulping with the Escher-Wyss equipment

Fig. 1 shows the Escher-Wyss installation that was used in making semichemical pulps in yields of 70 to 85 per cent. In the present study, neutral sulfite semichemical pulps were prepared from aspen (I), spruce (II) and beech (III), using appropriate amounts of sodium sulfite and sodium carbonate to give a pH of about 10.0. A high ratio of wood to cooking liquor

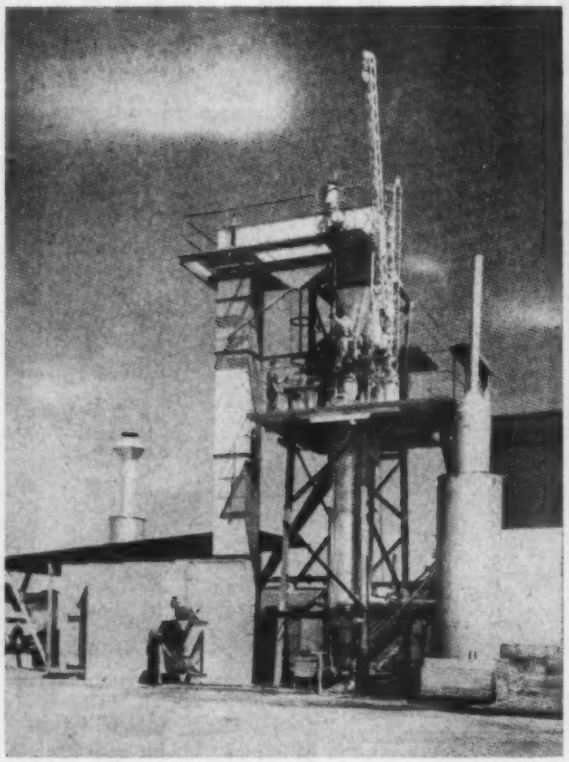


Fig. 1

was used and the pulping was preceded by evacuation and impregnation of the chips. Digestions were carried out at 174 to 177° C.; 47 minutes for I, 65 for II, and 69 for III. The pulp yields for I, II and III were respectively 78.8, 83.5 and 73.2 per cent. These pulps were then beaten to 54.5 to 58.5° Schopper-Riegler (S-R), and the following properties were determined and compared: basis weights, breaking lengths, burst, Brecht-Imset tear factor, folding endurance and brightness. The preparative method was especially adapted to the hardwoods, and their pulps required less beating to attain a definite degree S-R than did II. I-pulp showed the highest breaking length, burst, tear and folding endurance (at 50° S-R), although at intermediate degrees S-R (11 and 30°) spruce showed a higher tear factor, which on longer beating fell below those of I and III. II showed the lowest brightness, whereas III-pulp showed the highest. In general III showed relatively low strength properties; this was especially true of folding endurance. After corrugating the three pulps, studies were made using the Concora Medium Test (C.M.T.). This was done on corrugated pulps that had been beaten to various degrees S-R. Usually II-pulps showed the lowest values; this was invariably the case when beaten originally to 30° S-R. This is indicated in Fig. 2 [in which Fichte = spruce, Pappel = aspen, and Buche =

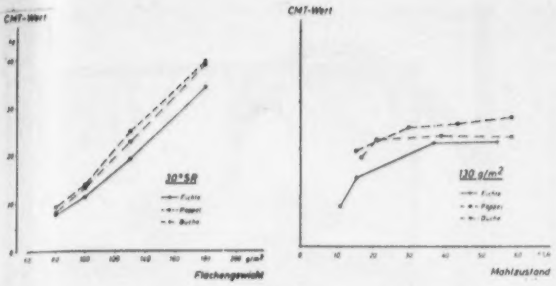


Fig. 2

beech; Flächengewicht = the weight of a square meter of the pulp sheet, and Mahlzustand = degree of beating (*i.e.* S-R)]. The C.M.T. values for I and III pulps are quite similar, but depended on the weight of the sheet. These values are shown in Fig. 2.

W. Brecht, G. Merckens, and K. Tengler, *Wochbl. Papierfabr.* **88**, 451 through 60 (1960) (in German).

New apparatus for measuring drainage of pulps

The apparatus is based on the well-known principle of measuring drainage as a function of time. The new equipment permits the study of pulp under conditions resembling those at the wet end of a papermachine. The instrument is similar to the upper portion of a Canadian Standard Freeness Tester. Pulp is drained in part by gravity and in part by pressure that can be applied to the surface of the pulp suspension. Throughout the drainage, at short intervals (that can be controlled fully), a measurement is made of the amount of water drained per unit of time.

Experimental conditions could be varied widely and at will. For routine control work, the apparatus could be simplified. Fig. 3 gives a schematic sketch of the equipment, the parts of which are

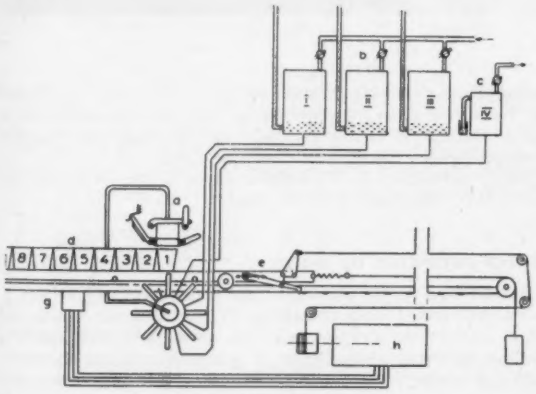
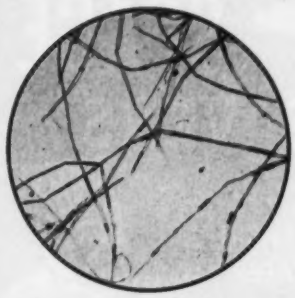


Fig. 3

as follows: (a) drainage tank; (b) 3 pressure containers (I, II, and III); (c) vacuum container (IV); (d) 20 water vessels (only 8 of which are shown); (e) train and track for conveying water vessels; (f) eight-way valve controlling the pressure conditions in (a); (g) electric switch for changing speed of the train; (h) electrically driven and shifted wire drum for controlling the train speed.

Fig. 4 shows more clearly the drainage tank (a), a few of the water vessels (d) and the 8-way valve (f). Results with this equipment (the operation of which is explained fully) were highly reproducible. The average deviation from the arithmetic mean varied from 0.4 to 1.8 per cent. The standard deviation lay between 0.6 and 2.0 per cent.

Drainage properties of a pulp can be so characterized that its behavior from the breast roll to the first suction boxes of a papermachine can be gaged. Drainage properties could be expressed by three values characteristic of the different stages and properties



Celgar Kraft will contain long, thick-walled fibres

1. High Tearing Resistance

Celgar Kraft will contain long, strong fibres such as these from Interior-grown western hemlock. They will give the final paper product the high tearing resistance which is the outstanding characteristic of Western Canadian kraft pulps.

Celgar Kraft

V5763-1

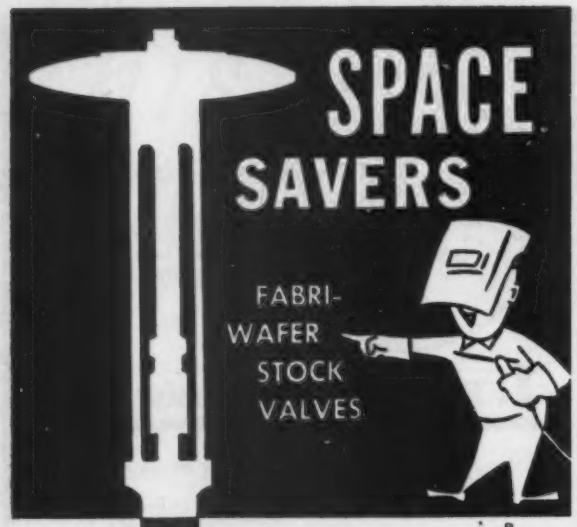
For more data circle 139 on Post Card

- EXCLUSIVE Span-Jet Nozzles . . . 160° hollow cone spray . . . 180° flat circular spray . . . capacities .75 to 10 GPM
- EXCLUSIVE Tan-Jet Nozzles . . . solid cone spray . . . capacities .50 to 10 GPM
- EXCLUSIVE Simplified, time-saving nozzle selection tables
- PLUS 32 pages of other illustrated industrial spray nozzles, flow chart, spray patterns, spray characteristics and basic engineering data.

Write for your free copy today.

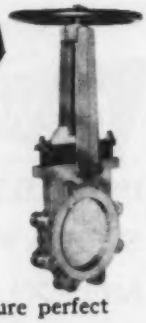
STEINEN S NOZZLES

WM. STEINEN MFG. CO.®
INDUSTRIAL NOZZLE DIVISION
47-39 Bruen Street, Newark, New Jersey
SERVING INDUSTRY FOR MORE THAN FIFTY YEARS
For more data circle 140 on Post Card



NOW
AVAILABLE
in
either

FABRICATED
or CAST
construction



Only FABRI-VALVE
Gives you all these
FEATURES!

- Inverted Packing Gland to assure perfect gate alignment (patented).
- Many alloy combinations to combat corrosion EFFECTIVELY.
- Optional O-Ring Seating.
- Surface ground gates for smooth, easy operation.
- Pre-formed, SELF LUBRICATING rubber packing for minimum maintenance.

and many more advantages . . .

WEDGE GATES
STOCK VALVES
BUTTERFLY VALVES
CHECK VALVES
DIGESTER VALVES
V-PORT METERING

TRADE MARK
FABRI-VALVE
COMPANY OF AMERICA
91 N. E. RUSSELL ST.
P. O. BOX 4352, PORTLAND 8, OREGON

For more data circle 141 on Post Card

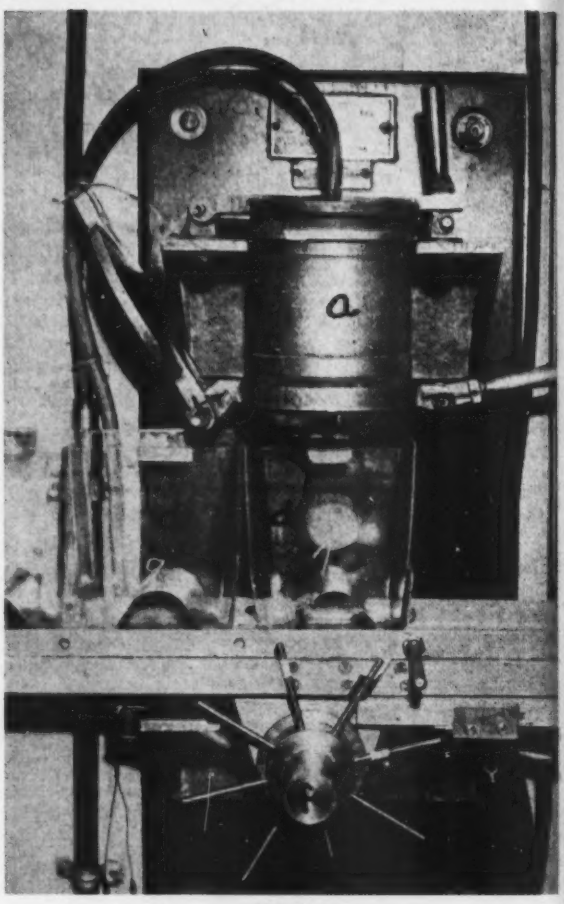


Fig. 4

during the course of the drainage, by means of a single test. Drainage curves are given for a mechanical pulp, an unbleached sulfite and an unbleached kraft pulp, under similar conditions of degree Schopper-Riegler, temperature, consistency, et al.

Fifteen references. G. V. Alfthan. *Paper ja Puu* (Finland) 42, No. 4, 287 to 292 (1960) (in English).

Starch retention by pulps

A "standard" pulp suspension was prepared as follows: 25 g. (oven-dry) mixed pulp containing 17.5 g. bleached sulfite and 7.5 g. bleached beechwood pulp was rasped and defibered in a Starmix apparatus using 750 cc. of water, then throughly mixed with 2 per cent size and 8 g. Blanc fixe and stirred vigorously.

In each experiment various concentrations of an appropriate starch were stirred into this pulp mixture for 5 minutes and then treated with alum to give a pH of 4.5. In the case of a commercial rice starch preparation (I), this was added in powdered form. In the case of potato starch (II), corn starch (III) and untreated rice starch (IV), these were introduced in the form of pastes. After standing, the entire mixture was diluted with water to 1 liter, allowed to stand undisturbed for 0.5 hour and then filtered through a screen. The filtrate was hydrolyzed with hydrochloric acid, and refiltered (from any fibrous debris) and the hydrolyzate examined polarimetrically. This gave an index of the starch *not* retained, and the retention was determined by difference.

Concentrations of I, II, III and IV used in these experiments ranged from 2 to 8 per cent. The lowest retention was obtained with II, the highest with I. Fig. 1 shows the retention (in per cent based on the original dry pulp) of various starches. Here the Starch added (= "Stärke Zusatz") is given on the abscissa; the percentage starch retained is shown on the ordinate. A = II; B = III and C = I. The highest percentage retention was obtained

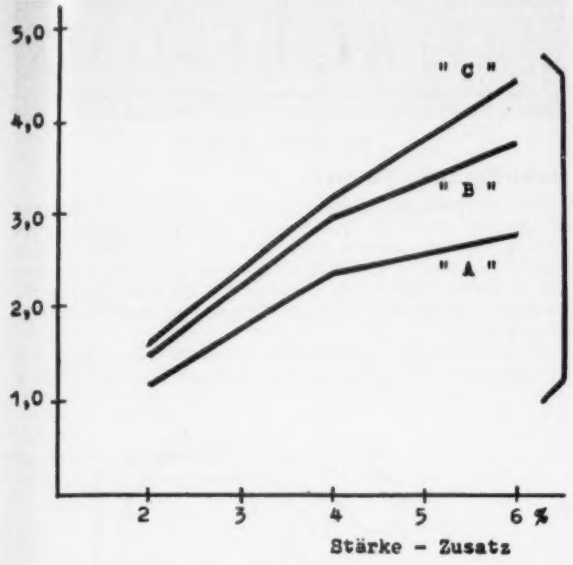


Fig. 5

up to 4 per cent starch, and the drop in percentage retention is indicated by the break in the graph. However, the higher the concentration of starch, the higher was the actual amount of starch retained by the pulp. A few data are also given for the retention of I by mechanical pulp, and in every case, the retention was lower than that obtained with the "standard" pulp.

Changes in the paper properties by the addition of I were shown in a series of mill runs (using a somewhat different pulp furnish). Usually the improvement in strength was greater in the machine than in the cross-machine direction, but that was not invariably the case. Breaking lengths improved rapidly up to 4 per cent I addition, and then more slowly. Elongation was greatest in the cross-machine direction, at about 4 per cent addition, and this was greater than that found in the machine direction. This was also true for the tear-through. Resistance to bending was higher in the machine direction, and was greatest with 4 per cent I additions. Bekk smoothness increased with increasing concentrations of I and this was also true for brightness and gloss. The higher the I additions, the lower was moisture sorption of the sheet, when the relative humidity was 85 per cent. Graphs are shown in all these instances and the data on sorption and retention are tabulated.

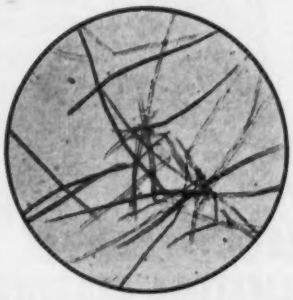
R. Dittmar and H. Stein., *Wochbl. Papierfabrik.* **88,** 543 through 550 (1960) (in German.)

Evaluation of gloss

A new testing instrument is described. This is termed the "gloss mirror". It is true that no universally accepted definition for gloss has been devised, however, the present writer states that, essentially, gloss is the degree of orientation with which an incident beam of light is reflected from a plane. The greater the percentage of light rays are reflected in an oriented (rather than a diffuse) manner from a surface, the greater will be the visual gloss of that surface.

It was on this basis that the new, simple, visual gloss meter or comparator was developed. In this instrument, a series of letter characters in various standard typographical sizes are projected on the material that is to be evaluated. Such a material may be paper, plastic film, a foil, or any other packaging material. The smallest type size that is still readable without blurring in the mirror of the instrument gives a comparative measure of the surface gloss (which is termed the "distinctness of image" gloss). The brightness and the color of the material, it is claimed, do not affect the validity of the gloss comparisons or the reliability of the new instrument.

Anonymous. *Verpackungs-Rundschau,* 11, No. 4, 319 through 322 (1960), (original in German) through *Abstr. Bull. Inst. Paper Chem.,* 30, 1460 (1960).



Celgar Kraft also will contain thinner-walled fibres

2. High Bursting Resistance

Celgar Kraft also will contain thinner-walled fibres from such species as spruce, balsam and cedar. These impart to the final paper product the high bursting resistance which is the outstanding characteristic of Eastern Canadian and Scandinavian bleached kraft softwood pulps.

Celgar Kraft

V5763-2

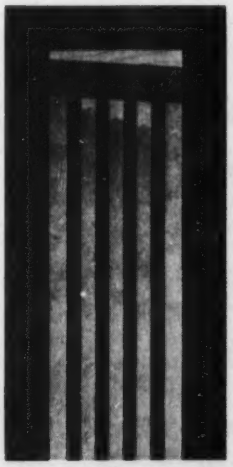
For more data circle 139 on Post Card

END OF GRAIN MAPLE

SLOTTED SUCTION BOX COVER

Time-proved in mills everywhere for extending wire life and providing an even vacuum. The smooth, long-wearing wax-like surface eliminates streaks, reduces pin holes, improves tensile strength and fiber formation.

Tough, laminated plastic cross members support the end-of-grain maple lands and completely eliminate sag.



Made by the manufacturer of Res-Lin and Met-al-Rib Suction Box Covers

WIRE LO-VAC SAVER

U.S. Patents No. 2,618,206 and 2,740,332
Can. Pat. No. 477,588

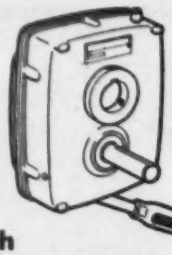
Write for name of nearest representative and literature.

APPLETON WOOD PRODUCTS CO.
Appleton, Wisconsin

For more data circle 142 on Post Card

FOOTE BROS.

SHAFT MOUNTED DRIVES



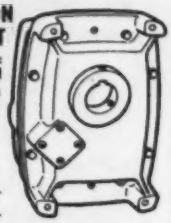
SINGLE REDUCTION
Output Speeds: 90 to 420 RPM
Capacities: ¼ to 40 HP

with

Duti-Rated LIFETIME GEARING

DOUBLE REDUCTION
Output Speeds: 10 to 135 RPM
Capacities: 1 to 30 HP

DOUBLE REDUCTION FLANGE MOUNT
Output Speeds: 10 to 135 RPM
Capacities: 1 to 7 HP



High hardness, premium quality Duti-Rated Lifetime Gearing in Foote Bros. Shaft Mounted Drives gives them greater load carrying capacity with long service life. Quick, easy installation on driven shafts with diameters from 15/16" to 3-7/16" saves time, labor, eliminates need for couplings and adjustable motor mount. Built-in backstop to prevent reverse rotation.

Write for Shaft Mounted Drive Catalog.

FOOTE BROS. GEAR AND MACHINE CORPORATION
4573 South Western Boulevard, Chicago 9, Illinois

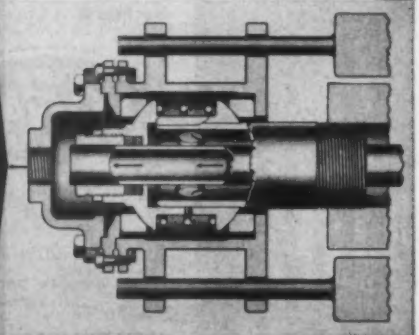
For more data circle 143 on Post Card

For High Speed Paper Machines with Revolving Syphon Pipes

In the Type LN Johnson Joints the revolving syphon pipe is made a part of the rotating assembly, yet is permitted longitudinal movement. Sealing is still accomplished without packing. Simple support rods carry all the weight of joint and connections, permit the rotating assembly to "float" freely inside. Special hangers and brackets adapt the mounting for machines with either open or enclosed gearing.

Johnson Joints fit all needs on paper machines, calenders, corrugators, waxers, embossers, roofing machines, printing presses. For full data on Type LN write for Bulletin N-2002.

Type LN Johnson ROTARY PRESSURE Joints "First in the paper industry"



THE JOHNSON CORPORATION
845 Wood St., Three Rivers, Michigan

For more data circle 144 on Post Card

PATENT REVIEWS

DR. MELVIN NORD

Multi-Ply Sheet Former

U.S. 2,942,661, issued June 28, 1960 to Edward D. Beachler and assigned to Beloit Iron Works, describes an apparatus for forming multi-ply sheets of paper, in which several layers of pulp may be deposited in superimposed relation on a fourdrinier wire, and in which water may be removed from the pulp layers as deposited so that the water may be segregated for separate recovery of pulp from it.

As shown in Fig. 1, forming wire 12 passes over rolls 21 and 31 which are connected to vacuum sources at 24 and 34. Stock

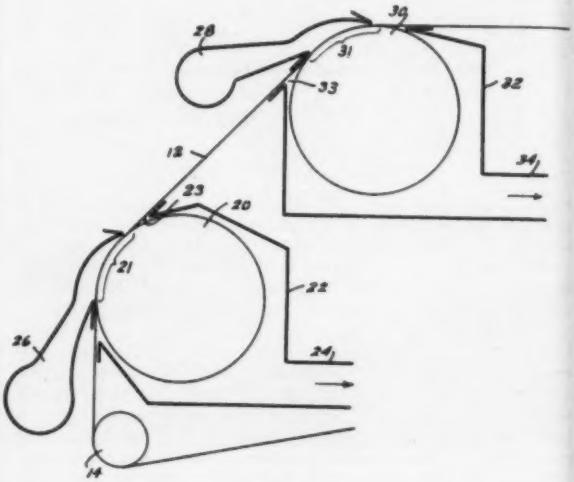


Fig. 1

inlets 26 and 28 are arranged for depositing stock on the wire. As the stock is deposited, water is extracted from it by suction within the enclosures 22 and 32, and may be carried off for subsequent recovery of the remaining pulp.

Cylinder Type Paper Making Machine

U. S. 2,942,662, issued June 28, 1960 to John E. Goodwillie and assigned to Beloit Iron Works, relates to cylinder paper machines capable of being efficiently operated at high speeds.

Heretofore, it has been difficult to operate cylinder paper machines having a cylinder mold roll at high speeds where a coucher roll and pick-up felt are employed to remove the paper web from the cylinder mold surface. The nip defined between the coucher roll and the cylinder mold roll ran extremely wet to the point where the paper sheet crushed under the coucher and the pick-up was very uncertain. Hence, when desiring to run the cylinder mold roll at higher speeds, the problem encountered was to dry up the nip between the coucher and cylinder mold roll, and provide positive pick-up of the sheet.

In the present invention, a foraminous cylinder mold roll is suspended in an enclosure having an opening in the top thereof, part of the mold forming surface projecting through the opening. An adjustable duct means is provided for selectively delivering a variable stock flow to the cylinder mold forming surface. A pick-up or coucher roll having a felt trained thereover defines a nip with the cylinder mold forming surface.

In solving the above mentioned problem, the enclosure is subjected to a negative pressure, thereby creating a pressure differential across the forming surface of a cylinder mold roll. This causes a stream of air to enter above a sealing blade of the enclosure coacting with the cylinder mold roll forming surface, and below the pick-up. This blows the water entrained in the

meshes of the wire back into the interior of a cylinder mold roll, and doctors off from the undersurface of the wire the sheet of water which is carried on the undersurface by the combination of adhesion to the wire and centrifugal force.

In order to obtain a positive pick-up of the paper sheet from the cylinder mold roll forming surface and to further dry up the pick-up nip, a suction pick-up roll is trained over it, defining the nip with the cylinder mold roll forming surface.

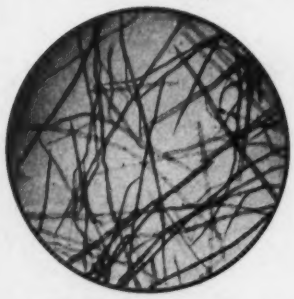
Method of Manufacturing Unified Paper Containing Titania

U. S. 2,947,658, issued August 2, 1960 to Joseph R. Wechsler, Edward W. Engel, and Paul Lagally, assigned to Johnson & Johnson, describes a method of forming a unified paper sheet having improved characteristics of wet tensile strength, tear strength and delamination resistance, and adequate flexibility and elongation.

The process begins with mixing, with a slurry of paper pulp, a latex of an elastomeric impregnant and a solution of reactive titania (monomeric orthotitanic acid or a water soluble low polymer of orthotitanic acid). The elastomeric impregnant is then precipitated onto the fibers. A paper web is then formed and dried to form a paper sheet.

Other Patents of Interest to the Pulp and Paper Industry

Subject	Inventor or Assignee	Patent No.	Date
Pressure applying machine for use in paper box making	City Paper Box Co. Ltd.	2,941,452	6/21/60
Edge aligning means for travelling combining webs	Eastern Corrugated Container Corp.	2,941,572	"
Regulation of corrugating machines	Robert T. Cassady	2,941,573	"
Fourdrinier wire stretch	The Sandy Hill Iron & Brass Works	2,941,593	"
Apparatus for handling flexible walled bags	Riegel Paper Corp.	2,941,676	"
Molded pulp container	Diamond National Corp.	2,941,708	"
Shipping container	Westinghouse Electric Corp.	2,941,709	"
Paperboard display stand	Max Stern's Sons Co.	2,941,773	"
Bag-making machine	Continental Can Co. Inc.	2,942,529	6/28/60
Blank wrapping mechanism for cup making machines	Paper Machinery Corp.	2,942,530	"
Bottom expander for paper cups	Paper Machinery Corp.	2,942,531	"
Apparatus for forming a divider in a box	American Greetings Corp.	2,942,532	"
Apparatus for setting up corner lock cartons	Somerville Ltd.	2,942,533	"
Rotary cutter for paperboard box machines	St. Regis Paper Co.	2,942,534	"
Paperboard carrier with handle	Container Corp. of America	2,942,756	"
Stretching machine for dryer felts	Scapa Dryers Inc.	2,943,375	7/5/60
Papermaker's felt	Lockport Felt Co. Inc.	2,943,379	"
Disposable paper slipper	Bagcraft Corp. of America	2,943,403	"
Pulpwood-debarking drum	Coosa River News Print Co.	2,943,656	"
Papermaking apparatus	Sandy Hill Iron & Brass Works	2,943,678	"
Cartons	Unipak Cartons Ltd.	2,943,762-3	"
Dispensing carton	KVP Sutherland Paper Co.	2,943,779	"
Recessed automatic bottom carton	Standard Packaging Corp.	2,943,780	"
Multiwall bag tear strips	St. Regis Paper Co.	2,943,781	"
Paper machinery	Black-Clawson Co.	2,943,806	"
Casting surface for producing castsurfaced mineral coated paper	Mead Corp.	2,943,954	"
Paper pigments	Columbia-Southern Chemical Corp.	2,943,970	"
Pigmented paper	Columbia-Southern Chemical Corp.	2,943,971	"
Extrusion coating apparatus	Lowe Paper Co.	2,944,586	7/12/60
Packaging device	Norton Co.	2,944,716	"
Tray package	Baljak Corp.	2,944,717	"
Multicellular folding boxes	Federal Paper Board Co. Inc.	2,944,718	"
Container	Federal Paper Board Co. Inc.	2,944,719	"
Cartons	David Leokoff et al	2,944,720	"
Paperboard berry box	Riverside Mfg. Co. Inc.	2,944,721	"
Interlocked carton	Owens-Illinois Glass Co.	2,944,723	"
Hinge-cover folding boxes	Baljak Corp.	2,944,724	"
Carton with snap-lock closure	Fibreboard Paper Products Corp.	2,944,727	"
Treatment of spent sulfite liquor	Sulphite Products Corp.	2,944,922	"



Celgar Kraft will have balanced properties

3. Balanced Properties

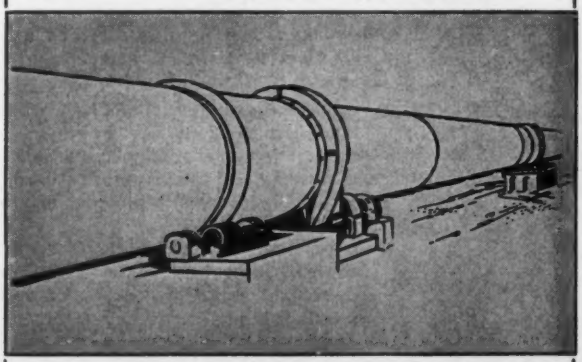
Through its mixture of long, strong, thick-walled fibres and its thinner-walled fibres, and due to the climatic conditions influencing tree growth, Celgar Kraft will achieve naturally a balance of strength properties which can normally only be duplicated by blending several grades of pulp.

Celgar Kraft

V5763-3

For more data circle 139 on Post Card

REBURNING LIME SLUDGE?



DO IT BEST WITH A VULCAN KILN

All equipment made by Vulcan must measure up to the standard of quality and responsibility it has taken 111 years to earn. Contact Vulcan today . . . estimates, constructive suggestions and preliminary drawings will be furnished (as far as possible) without obligation.

VULCAN IRON WORKS INC.

Wilkes-Barre, Pa. Cable Address: Vulworks

"The Oldest Name in Rotary Kilns"

For more data circle 145 on Post Card

NEW ADVANCES IN LOW COST QUALITY PULP SCREENING

IMPCO CENTRIFUGAL SCREENS FOR:

Washed Stock Screening
Hot Stock Screening
Sealed Black Liquor Knotting
Fibre Length Classification
Paper Stock Cleaning

The new Impco Centrifugal Pulp Screen is the latest example of the progress made toward the ultimate in low cost quality screening. This screen incorporates many improved principles and features such as:

- — a stock inlet allowing direct top, bottom, front or rear infeeding which simplifies installation piping;
- — a tangential inlet which changes flow direction from linear to rotating, yet retains velocity head;
- — a special stator which provides uniform internal distribution of pulp;
- — a patented high-efficiency rotor which increases capacity without additional horsepower;*
- — a bottom accepted stock outlet permitting all sub-floor piping;
- — a full length quick-opening door for routine accepted stock sampling;
- — an accessible rejects outlet for tailings inspection or sampling.

These features are resulting in peak capacities and high discharge consistencies at lowest horsepowers. Reject richness is readily controlled. Engineered simplicity is characteristic of the entire line of Impco Centrifugal Screens which require very little operating attention and mechanical maintenance.

* U. S. Patent No. 2,845,848.

IMPROVED MACHINERY INC.

NASHUA, NEW HAMPSHIRE

In Canada, Sherbrooke Machineries Ltd., Sherbrooke, Quebec

For more data circle 146 on Post Card

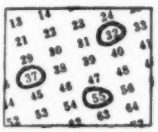
S
T
G
960

FOR FURTHER INFORMATION ON

- New Products
- New Literature
- Advertised products and services

Use this Return Card

To obtain further information quickly—and at no obligation—on any of the above items in this issue, circle the corresponding number on the attached card. We will forward your request promptly to the manufacturer, who will send the information directly to you.



*Requests from outside the United States must be placed in envelopes, stamped and addressed to: Readers' Service Dept.

The PAPER INDUSTRY
431 South Dearborn St.
Chicago 5, Ill., U. S. A.

NOVEMBER, 1960

NOTE: Card void after January 31, 1961

The PAPER INDUSTRY

Please have the manufacturers send me without obligation information or bulletins indicated by the numbers circled below.

Name ..... **Title** .....

Company Name ..... (Must be included)

Company Address .....

City ..... **State** .....
(If you prefer delivery at home, give home address, too)

Home Address .....

City ..... **State** .....

New Products and New Literature

1	2	3	4	5	6	7	8	9	10	11
12	13	14	15	16	17	18	19	20	21	22
23	24	25	26	27	28	29	30	31	32	33
34	35	36	37	38	39	40	41	42	43	44
45	46	47	48	49	50	51	52	53	54	55
56	57	58	59	60	61	62	63	64	65	66
67	68	69	70	71	72	73	74	75	76	77
78	79	80	81	82	83	84	85	86	87	88
89	90	91	92	93	94	95	96	97	98	99

Advertised Products and Services

101	102	103	104	105	106	107	108	109	110	111
112	113	114	115	116	117	118	119	120	121	122
123	124	125	126	127	128	129	130	131	132	133
134	135	136	137	138	139	140	141	142	143	144
145	146	147	148	149	150	151	152	153	154	155
156	157	158	159	160	161	162	163	164	165	166
167	168	169	170	171	172	173	174	175	176	177
178	179	180	181	182	183	184	185	186	187	188
189	190	191	192	193	194	195	196	197	198	199

Postage Will be Paid by Addressee

No Postage Stamp Necessary If Mailed in the United States

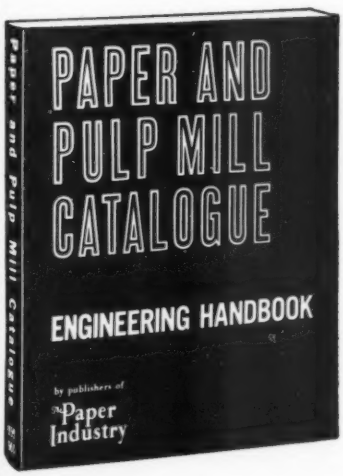
BUSINESS REPLY MAIL
FIRST CLASS PERMIT NO. 1704 — CHICAGO, ILLINOIS

Readers' Service Dept.

***The* PAPER INDUSTRY**

431 South Dearborn St.

Chicago 5, Ill.



37TH EDITION

ON THE DESKS OF MEN WHO SPECIFY AND BUY IN . . .

Every operating paper and pulp mill in the United States and Canada

A one-volume, composite Catalogue or permanent classified Reference File of manufacturers' catalogues, a Buyers Service Section, and the Engineering Handbook. Published annually in September.

This book provides a quick, "easy to use and order from", all-inclusive service which eliminates searching through files for individual catalogues and engineering books.

(Continued on opposite side)

Postage Will be Paid by Addressee

No Postage Stamp Necessary If Mailed in the United States

BUSINESS REPLY MAIL
FIRST CLASS PERMIT NO. 1704 — CHICAGO, ILLINOIS

Readers' Service Dept.

***The* PAPER INDUSTRY**

431 South Dearborn St.

Chicago 5, Ill.

NOVEMBER, 1960

NOTE: Card void after January 31, 1961

The PAPER INDUSTRY

Please have the manufacturers send me without obligation information or bulletins indicated by the numbers circled below.

Name..... Title.....

Company Name..... (Must be included)

Company Address.....

City..... State.....
(If you prefer delivery at home, give home address, too)

Home Address.....

City..... State.....

New Products and New Literature

1	2	3	4	5	6	7	8	9	10	11
12	13	14	15	16	17	18	19	20	21	22
23	24	25	26	27	28	29	30	31	32	33
34	35	36	37	38	39	40	41	42	43	44
45	46	47	48	49	50	51	52	53	54	55
56	57	58	59	60	61	62	63	64	65	66
67	68	69	70	71	72	73	74	75	76	77
78	79	80	81	82	83	84	85	86	87	88
89	90	91	92	93	94	95	96	97	98	99

Advertised Products and Services

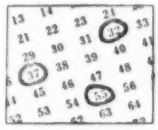
101	102	103	104	105	106	107	108	109	110	111
112	113	114	115	116	117	118	119	120	121	122
123	124	125	126	127	128	129	130	131	132	133
134	135	136	137	138	139	140	141	142	143	144
145	146	147	148	149	150	151	152	153	154	155
156	157	158	159	160	161	162	163	164	165	166
167	168	169	170	171	172	173	174	175	176	177
178	179	180	181	182	183	184	185	186	187	188
189	190	191	192	193	194	195	196	197	198	199

FOR FURTHER INFORMATION ON

- New Products
- New Literature
- Advertised products and services

Use this Return Card

To obtain further information quickly—and at no obligation—on any of the above items in this issue, circle the corresponding number on the attached card. We will forward your request promptly to the manufacturer, who will send the information directly to you.



*Requests from outside the United States must be placed in envelopes, stamped and addressed to: Readers' Service Dept.

The PAPER INDUSTRY
431 South Dearborn St.
Chicago 5, Ill., U. S. A.

OVER 500 PAGES OF INDISPENSABLE INFORMATION

CONTENTS:

- **Manufacturers Catalogue Section** — contains pages and complete inserts giving information and data on products of individual manufacturers. Pages appear in alphabetical order by names of manufacturers.
- **Buyers Service Section** — includes a comprehensive, cross-reference list of machinery, equipment, materials and chemicals with names of responsible manufacturers and suppliers; a list of trade names; complete addresses of all firms that are listed in the Section; and a directory of educational institutions in the United States and Canada having courses of instruction in the manufacture of pulp and paper.
- **Engineering Handbook Section** — a compilation of practical engineering data, formulas, graphs, charts, tables, etc., including a section dealing with uses and hazards of chemicals used in pulp and paper making. New material added yearly.

Paper and Pulp Mill Catalogue is published by . . .

FRITZ PUBLICATIONS, INC.
431 South Dearborn Street
Chicago 5, Illinois

NEW PRODUCTS

These items are numbered for your convenience. Further information on the various products described may be requested at no obligation through our Readers' Service Dept. Use the business reply card in this issue.

Two-speed proportioning pump & automatic sampler

The Technicon AutoAnalyzer, a two-speed proportioning pump and an automatic sampler, is now available in laboratory and plant models. It is a continuous flow system that automates each step of a chemical analysis now performed manually, including measuring, mixing, purifying, processing, comparing and recording. The sample size, time and temperature remain constant, and reproducible results can be obtained down to parts per billion with precision of ± 1 per cent. The process is self-correcting, and the set-up time between test series is reduced to as little as one minute.

The pump provides the operator with a choice of standard speed or high speed flow equal to 4½ times standard speed, making it practical to run 10 or 12 analyses daily on the same machine. The new sampler holds 200 test tubes of 30 ml. volume on an automatic, self-revolving rack, making it possible to test run the AutoAnalyzer for more than 30 hrs. with one rack loading. The machine can be set at the end of a day and will continue to operate overnight, providing 200 analytic results the following morning.

The sampler is equipped with two timers: one controlling a selective aspiration period, the other the total cycle time. The system is cleansed during the difference between the two timer settings. *Technicon Controls Inc.*

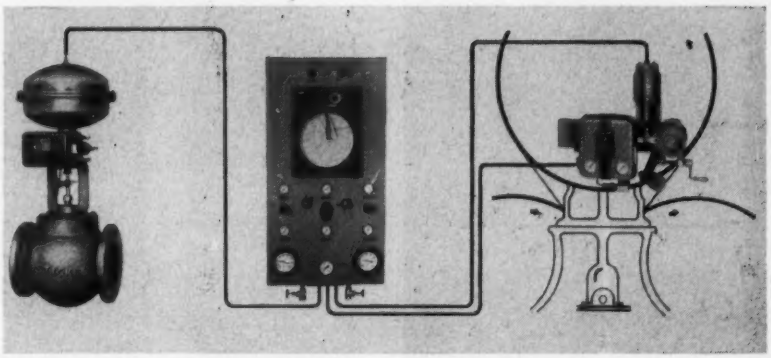
Circle No. 1 on Readers' Service Card

All-purpose lab mill

A unique, all-purpose lab mill, for compounding various rubber, plastic and allied materials for production and experimental testing, is termed the Dilts-JMC and features two 6 in. diameter by 13 in. face hardened and ground steel rolls, micrometer adjusted with spring return loading. With a weight of approximately 2,250 lbs., it operates at temperatures up to 450° F. using oil, or 350° F. using steam. Safety features include fully guarded, movable parts, convenient operator controls, knee panels and a 35-lb. foot brake.

Optional equipment includes chrome plated rolls, tilt aluminum guides, variable and dual variable speed drives, transparent atmosphere control cover, plus additional operator safety equipment. *Dilts Div., Black-Clawson Co.*

Circle No. 2 on Readers' Service Card



New moisture control system

The new Pres-ten-trol, Model 460-C for paper drying machines, handles paper of any weight from .0003 to the heaviest board, and is claimed to be one of the most simple, trouble-free systems ever built, therefore reducing the cost of installation and operation.

It consists of a super-sensitive adjustable detector with tension roll, control panel and diaphragm motor valve. The draw of the sheet, due to wetness or dryness, as sensed by the detector is signaled to the diaphragm motor valve. This valve then admits steam to the dryers in direct ratio to the draw of the sheet against the tension roll. *Stickle Steam Specialties Co.*

Circle No. 4 on Readers' Service Card

Interchangeable split body-valves

A series of split-body valves interchangeable on a mix and match basis with other valves and actuators is now being produced. The valve is available in straight-through, angle and corner types with fixed or separable flange construction, and is designed for free passage of even highly viscous fluids. Other features of the valve include: clamped-in seat ring, metal or Teflon guiding, non-lubricated V-ring packing, and contoured equal-percentage, linear or quick-opening plugs. *Minneapolis-Honeywell Regulator Co.*

Circle No. 3 on Readers' Service Card

New scissor lifts

Three new scissor lifts for loading and unloading sheet stacks stress safety, control sensitivity, and are designed to give smooth performance in constant service. The air-driven model is self-locking and will hold its load if the air supply is interrupted. The platform is 24 by 72 in. and 8 in. high in its collapsed position. It has a vertical travel of 42 in. and a lifting capacity of 6,000 lbs.

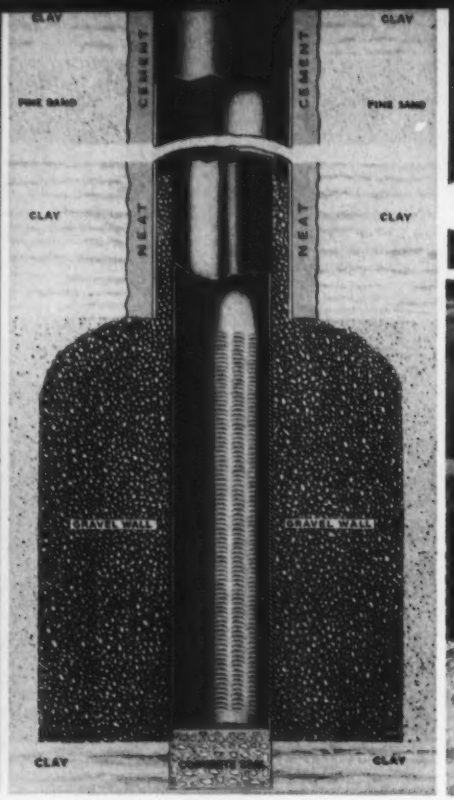
The second model is powered by a self-contained hydraulic unit, and the third model is a tray-type lift. The tray can be of varying dimensions. It has a 36-in. vertical travel and a lift capacity of 5,000 lbs. It operates on a low hydraulic pressure from its self-contained pump. *Lamb-Grays Harbor Co. Inc.*

Circle No. 5 on Readers' Service Card

Cellulose-digesting enzyme

A new cellulose-digesting enzyme is now available in bulk quantities for the first time. Cellase 1000 is a highly purified enzyme capable of depolymerizing cellulosic polysaccharides of high molecular weight into smaller fragments. The point of attack in the polymer chain is the 1, 4-B bend linking the D-glucopyranose residues.

A technical grade of the enzyme, known as Celzyme will be sampled for industrial uses. It is indicated that a strong cellulase of uniform assay could find use in textiles, pulp and paper, and the manufacture of



WATER WATER WATER

With A Layne Drilled Well Layne knows where the water-bearing formations are located. They have been drilling wells for over 75 years. This experience comes from searching and researching water aquifers. Knowing *where* to drill is half of the success—knowing *how* is the other half. In drilling a straight well experience counts—and you can count on Layne. Layne specializes in water well drilling. To get a good start for a water supply—you need a good well. You get a good, producing well when you specify a Layne drilled well. *Bulletin No. 100*

With A Layne Gravel Wall Well This technique and resulting arrangement of the new 134 Shutter Screen and gravel (shown here) permits the free flow of water into the well and affords the following advantages: larger shutter screen openings, reduced friction, reduced draw down and pumping head—thereby reducing pumping costs, increased specific capacity and more effective retention of native sands. Cemented wells are installed if indicated, and result in greater purity of supply as well as increased life of the well. *Bulletin No. 900*

With A Layne Vertical Turbine Pump Whatever the pumping requirement, there's a Layne pump to meet any pumping conditions. Layne Vertical Turbine Pumps come in a wide range of sizes and capacities, delivering 30 to 20,000 GPM and requiring from 4 to 42 inch well casings. The complete line of Layne Pumps include: Deep Well Vertical Turbine (oil or water lubricated), Short Coupled Vertical Turbine, Propeller, Mixed Flow, Fire Pumps and Volatile Liquids Pumps, Regular and "In-Line" Submersible. *Bulletins No. 200 (oil) 201 (water)*

LAYNE OFFERS COMPLETE WATER SERVICE: Initial surveys • explorations • recommendations • site selection foundation and soil-sampling • well drilling • well casing and screen • pump design, manufacture and installation construction of water systems • maintenance and service • chemical treatment of water wells • water treatment—all backed by Layne Research. Layne services do not replace, but coordinate with the services of consulting, plant and city engineers.

Layne SINCE 1862

WORLD'S LARGEST WATER DEVELOPERS

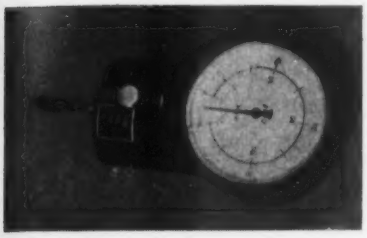
LAYNE ASSOCIATE COMPANIES THROUGHOUT THE WORLD

Sales Representatives in Major Cities

New Products . . .

various hydrophillic celloids based on cellulose backbones. Quantities will be available in October. *Wallerstein Co. Div. of Baxter Laboratories Inc.*

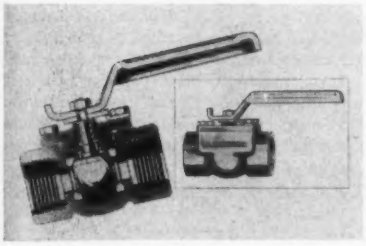
Circle No. 6 on Readers' Service Card



Hand tachometer

The Model HT-12 four-range, centrifugal type tachometer has stop-button feature to retain readings on dial until released. It measures rpm as well as fpm. Total range is 90 to 12,000 rpm and accuracy is ½ to 1 per cent. *Kernco Instruments Inc.*

Circle No. 7 on Readers' Service Card



New ball valve

Lunkeneimer Fig. 700 is being introduced in bronze body, screw ends, pipe sizes one-quarter to 2 in., with Teflon or Buna-N seats and seals. Entry through a removable top cover exposes the ball, which is easily removed by the tool on the valve's handle. The ball is flat on both top and bottom, enabling it to be removed from the body without breaking the pipe. Self-aligning, the ball rides on its seats, sealing at high or low pressure without springs or bearings.

Tested and proved are the straight-through flow, the low friction, smooth quarter-turn operations, compactness and practical maintenance. *Lunkenheimer Co.*

Circle No. 8 on Readers' Service Card

Narrow width winding machine

A new and versatile narrow width process and/or winding machine for any web or filament such as plastic, paper, or metal, is adaptable to any existing process, and is suitable for curing, drying, printing, laminating, coating, sheeting, or film-casting.

Ideal for either laboratory or production set-ups, it is identified as Model MARCO-1, and consists of three units: a constant tension unwind, a speed-controlled pull roller section and a controlled tension winder. The unwind brake comes either coupled, geared or chained, and may also be edge-controlled equipped with a web-centering assemble. An automatic edge-guiding set-up may be interposed between the pull roller section and the winder so as to edge align a web. All three units of this machine may be mounted in horizontal or vertical positions. *Web Controls Corp.*

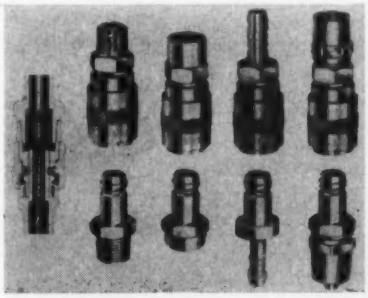
Circle No. 9 on Readers' Service Card

Paper chemical

The 3M Brand Paper Chemical FC-805 for the fluorochemical paper size is used to prevent strike through, to hold out dope on carbonizing tissue and to provide molten wax hold out in paraffin and microcrystalline papers.

This chemical can be applied on the paper or board machines like any other surface size, and requires no special equipment at the mill. It can can also be applied on corrugators, tinter-printer, color coaters, simple transfer rolls or other types of coating equipment commonly used by convertors. This chemical is a permanent treatment that penetrates the fibers of the paper and is not a coating or film. *Minnesota Mining & Mfg. Co.*

Circle No. 10 on Readers' Service Card

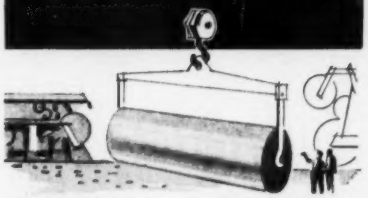


Interchangeable quick couplings

A new line of quick connect and disconnect couplings, which meet Military Specification MIL-C-4109A, offers greater flow, less pressure drop, and a smaller, more rugged, compact design. The patented Pushomatic one-hand operation is incorporated in this design. The coupling locks automatically, making a positive, leak-proof connection, highly resistant to impact. A full 360° swivel action reduces pneumatic tool operator fatigue, and eliminates hose kinking. The interchangeability of these couplings makes possible replacement of either coupling sockets or plugs, without changing or having separate air lines to existing production equipment.

These couplings are now available in

TRANSALL®
Pre-Lubricated Idlers . . .



Savings for the Pulp and Paper Industry

Transall pre-lubricated idlers are the product of years of experience in manufacturing belt conveyors for the pulp and paper industry. Bearings of Transall Pre-Lubricated Conveyor Idlers are factory sealed—never require re-lubrication. More important, perhaps, there is no leaking grease to deteriorate your conveyor belt. Entry of abrasive dust, foreign matter, etc., is kept to a minimum to prevent destruction of bearings, the heart of an idler. **Result:** No lubricating costs, longer belt life, idlers last longer, maintenance costs less.

Idlers are available in 20°, 35° and 45° equal and unequal length rolls with various roll diameters and thickness of tubing wall.

We also manufacture complete pre-engineered sectional belt conveyor systems. Write or wire Transall Inc., 109 No. 11th, Birmingham, Alabama, for complete details.

Perfectors of the Pre-Lubricated Idler

TRANSALL, INC.
109 North 11th St. • P. O. Box 1588
BIRMINGHAM ALABAMA

For more data circle 148 on Post Card

FLIPPING the LINT OFF "FLIP-TOPS"

Jenkins' METLKOR Web Cleaning Brush of DuPont Tynex Nylon

The gravure production plant of the Downingtown Paper Box Company, Downingtown, Pennsylvania is an engineering triumph. Here, Marlboro "flip-tops" are produced on Champlain presses at speeds up to 2400 cartons per minute.

HERE'S WHAT THE DOWNINGTOWN PAPER BOX COMPANY SAYS: Mr. George J. Wolfer, Gravure Supt. says: "Jenkins' METLKOR brushes are contributing to the overall economy and quality that is so important to our production. When we reorder brushes, they will be Jenkins' METLKORS."

HERE'S WHAT THE MANUFACTURERS OF THE CHAMPLAIN INLINE GRAVURE EQUIPMENT, OF HARRISON AVENUE, ROSELAND, N.J., SAY: "The Jenkins' METLKOR brushes used in the web cleaning process of our Champlain inline gravure equipment are superior in performance and efficiency and are providing satisfactory and economical operation for our customers all ... the world."

JENKINS' BRUSHES FOR PRINTERS

Dampener Roll Cleaning • Cylinder, hold down • Web Cleaning • Dusting • Removal of anti-offset powder • Feed. PAPER MILL BRUSHES: Conveyor Cleaning • Blanket Washer • Fourdrinier Wire Cleaning • Polishing • Coating • Dusting • Dampening • Spray • Sieve • Feed or Carrier • Static Elimination • Flocking • Felt Cleaning • Paint Brushes • Floor Sweeps • Void Detector

Specify Jenkins' METLKOR
the original . . . the best *Metal Core* brush

METLKOR®
CYLINDER BRUSHES
and **LIFEWOOD®** WOOD BACKED BRUSHES

M. W. JENKINS' SONS, INC.
Serving Industry for 80 Years
542 Pompton Ave., Cedar Grove
Essex County, N. J. • CEnter 9-5150

For more data circle 149 on Post Card

New Products . . .

various style end connections: male, female, hose stem and reusable hose connections, in sizes ¼, ⅜, ½ and ¾ in. with working pressures up to 10,000 psi. *Perfecting Service Co.*

Circle No. 11 on Readers' Service Card

Polypropylene gate valves

A new line, polypropylene throttleable gate valves, has been added to this company's plastic corrosion resistant fluid handling products. These valves are light in weight and are said to have high strength and chemical resistance in addition to possessing excellent resistance to most solvents, greases, oils, and the majority of common acids at temperatures up to 185°F.

They are available from stock in sizes from ½ to 2 in. with socket-weld, flanged or screwed ends and combine the features of straight through no pressure drop flow with close throttling control. *Vanton Pump & Equipment Corp.*

Circle No. 12 on Readers' Service Card

New plug valve

A new plug valve with a Teflon plug solves problems of friction, heat, corrosion and leakage. Wear is non-existent because a thin film of Teflon is transferred from the plug to the mating surface of the valve body, producing a condition of Teflon sliding against Teflon for a lifetime of smooth, easy operation. Because of the natural self-lubrication properties and low coefficient of friction, there is little need for oil or grease.

The Conant Teflon plug valves are for operation with air, oil, water and gas, and are rated for service up to 250 lbs. at temperatures from −320° F. to 500° F. They are resistant to nearly all chemicals, gases and solvents. The plug valve is available in IPS sizes ⅛, ¼, ⅜, and ½ in. with 2- 3- 4- or 5-way drillings. *Conant Bros. Co. Inc.*

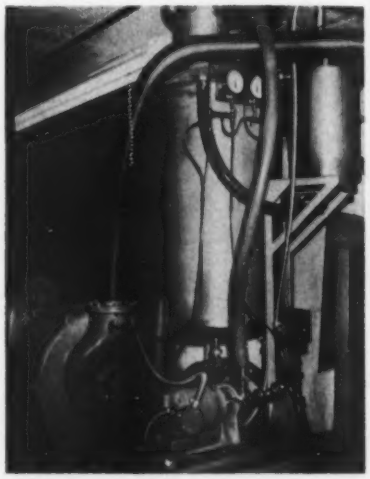
Circle No. 13 on Readers' Service Card

New liquid organic biocides

A new line of liquid organic biocides, highly effective against harmful organisms yet low in toxicity to humans, is now available for industrial cooling water. Readily soluble in all types of water, and easily fed into any industrial water system, they do not create dust or fumes, thus minimizing fire hazards. They are non-corrosive, and are compatible with sulfates, phosphates, chlorides, or carbonates in water.

Dearcide 702 is designed for treating injection water for secondary oil recovery. Effective against sulfate reducing bacteria, a primary cause of corrosion and plugging in water flood systems, it is recommended for both fresh and brine water. Dearcide 703 is designed for use in recirculating cooling water systems reducing slimes or algae growths by destroying the sulfate reducing bacteria. *Dearborn Chemical Co.*

Circle No. 14 on Readers' Service Card

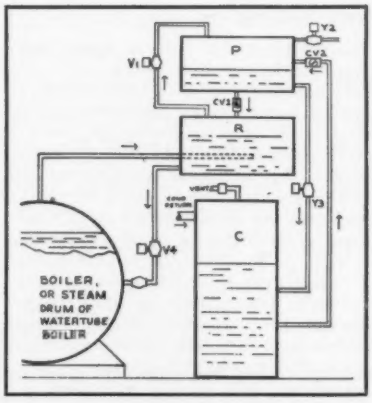


Compact chemical feed system

A compact chemical feed system, with applications in the chemical and paper industries has been developed of stainless steel and non-corrosive materials with a main reservoir mixing tank, a sanitary circulating pump, full flow filter, constant level feed tank, drains, and by-pass valves. All valves and piping can be disconnected.

These packaged units may be installed in conjunction with Curlator's Rando-Bonder or other processing line or chemical compounding equipment in minimum time. *Curlator Corp.*

Circle No. 15 on Readers' Service Card

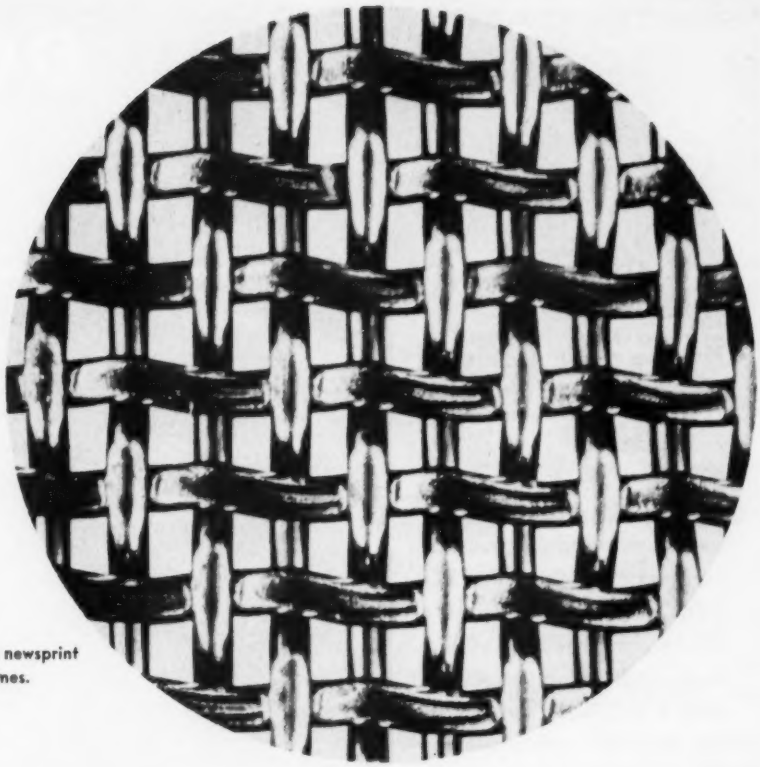


New boiler feeder

An outstanding feature of the new H T Boiler Feeder is the complete elimination of condensate flash loss. It is basically a gravity flow system with none of the disadvantages of conventional pump-type feedwater systems. The H T Boiler Feeder system is adaptable to all natural circula-

APPLETON WIRES

. . . are good wires!



Photomicrograph of newsprint wire enlarged 25 times.

leading manufacturer of wires for NEWSPRINT

APPLETON WIRE WORKS Corp.

PLANTS AT APPLETON, WIS. AND MONTGOMERY, ALA.:
INTERNATIONAL WIRE WORKS, MENASHA, WIS. AN AFFILIATED COMPANY

For more data circle 150 on Post Card

Production Costs DOWN

Finished Production UP

Nichols Freeman

VORVAC®

Separators

COMPLETE REMOVAL of free air, with simultaneous removal of dirt is the VORVAC way. Compact—maintenance free—instrument controlled stock conditioning system. Install a VORVAC system to improve your product. Contact us for recommendations.

INCREASES:

Production
Sheet Density

IMPROVES:

Fibre Dispersion
Drainage on Wire

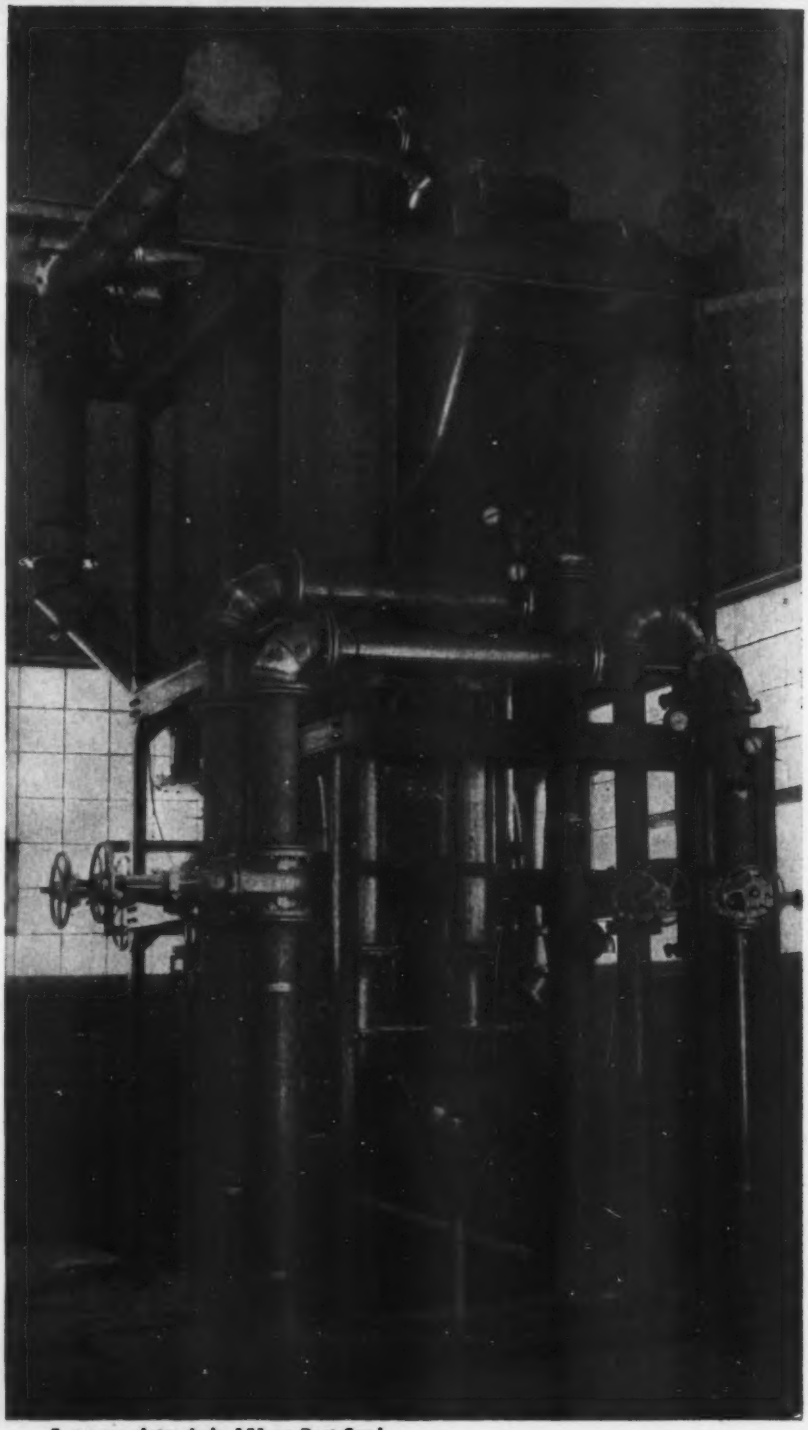
ELIMINATES:

Foam Killers
Headbox Showers

NICHOLS

NICHOLS ENGINEERING & RESEARGH CORP.

80 Pine St., New York 5, N. Y.
405 Montgomery St., San Francisco 4, Calif.
1477 Sherbrooke St., West
Montreal 25, Canada

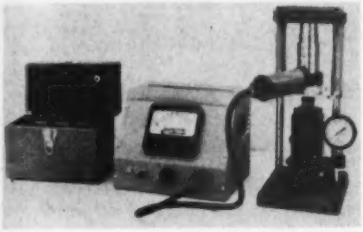


For more data circle 151 on Post Card

New Products . . .

tion firetube and watertube boilers. Tanks P and R are located above the waterline of the boiler for gravity feed. With slight modification, the boiler feeder system can also be used with forced-circulation or once-through boilers. *H T Boiler Feeder Co.*

Circle No. 16 on Readers' Service Card



Electronic meter

The new G-6 Moisture Register is a fast moisture test for ground, powdered, loose or shredded materials. It can be used anywhere, requiring one minute per test and no special skill or training for accurate work. It employs high hydraulic pressure to assure an homogenous sample and is already calibrated for ammonium nitrate, ammonium sulfate, sulfur, calcium carbonate, sodium bicarbonate and starches. *Moisture Register Co.*

Circle No. 17 on Readers' Service Card

Tank cleaner

This new light-weight, heavy-duty tank cleaner is water powered, and has a wide application in the chemical, petroleum, and paper processing fields. Model H tank cleaner weighs 42 lbs, and can be used with either two or four nozzles, which rotate in both the horizontal and vertical planes.

The unit operates efficiently at pressures from 28 psi. to 170 psi. and at temperatures up to 203° F. Capacity range is 3800 to 8500 gal. per hour. It performs effectively in any position.

Optional equipment includes the four-leg collapsible stand, specialized foam-killing nozzles, a spare parts kit, and a water pump. *Sellers Injector Corp.*

Circle No. 18 on Readers' Service Card

Boosted electrical power for storage batteries

Electrical power of industrial storage batteries for stationary service can be boosted by 66 per cent. This can be achieved by introducing a positive-plate design incorporated in a new battery called the EHGS Exide-Ironclad. This battery surpasses others used in electric utility, telephone, microwave, emergency lighting and power, fire alarm, and laboratory service.

This battery is estimated to last 20 years or more in float-charge service. In addition, EHGS models have from 100 to 150 per cent more ampere-hour capacity at the eight-hour discharge rate than the Plante'-plate batteries, thus saving on floor space and on cost. *Exide Industrial Div., Electric Storage Battery Co.*

Circle No. 19 on Readers' Service Card

Viscometer

The new 15 speed Epprecht Viscometer for laboratory and in-line process use is capable of 15 readings that can be used to produce accurate rheograms and automatically control manufacturing processes, when flow characteristics are a function of product quality. The viscometer speed varies from 5.6 to 352 rpm with shear rates from 1 to 2000 sec. and shearing force from 2 to 200,000 dynes per sq. cm. It measures viscosity of liquids, pastes and many plastic materials in the range from 0.2 to 10,000,000 cps. The electrical requirements are 110 volts, 60 cycle ac. *J. W. Fecker Div. of Amer. Optical Co.*

Circle No. 20 on Readers' Service Card

Heavy-duty laboratory balances

Available in capacities of 45 and 70 lbs., the new balances are known as Troemner Series 80, and are for use wherever liquids or solids must be weighed with great accuracy. Two stainless steel weigh beams are graduated in grams and ounces and a completer set of weights is included on an integral weight rack. Tare capacity is 2 kilograms.

Smooth, easy-to-clean, corrosion-resistant surfaces and ready portability are added features of the new balances. Bulk-weighing scoop and small-animal box are optional accessories. All models measure 34 in. long, 11 in. wide, and 10 in. high. *Henry Troemner Inc.*

Circle No. 21 on Readers' Service Card

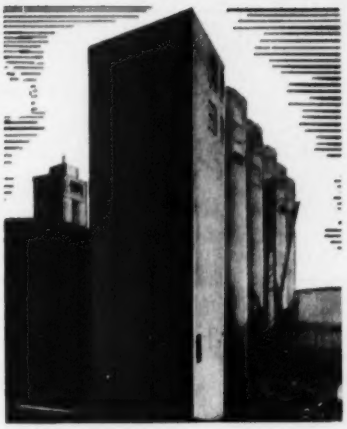
New heater for drying paper coatings

The Dielectric Heater Grid is used for drying paper coatings, cements and laminates, and can be added to exisiting machines. It is noted for high speed drying and heating without surface bubbling or hardening, for heating plastics in sheet form, for end drying when low moisture is a problem, and for lack of discomforting room heating. *Automation Controls of America.*

Circle No. 22 on Readers' Service Card

Chemical meter

The Pulsafeeder Microflo LS-5 handles highly corrosive as well as non-corrosive liquids. It can be used as a sampler, a proportioner, a filling machine, a chemical feeder, a pump, or a means for fluid control by responding to instruments measur-



Save Man Hours

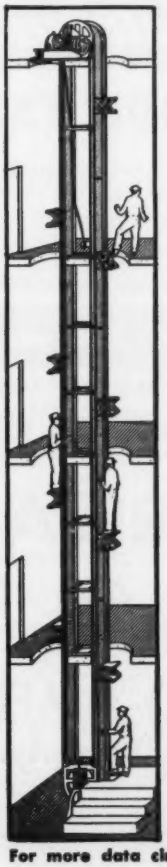
Equip Your Digester House with a

HUMPHREY

Employee's Manlift

ELEVATOR

Eliminate stair climbing — save time — reduce employee fatigue. The endless belt provides continuous up and down transportation to and from sampling and operating floors. Easy and safe to operate with ready-at-hand stop and go controls and the exclusive Humphrey Safety Features.



Can be installed in any Multi-Floor Building

Send us your requirements . . . we'll furnish complete information and prices.

HUMPHREY ELEVATOR COMPANY

Inc.

346 1st Ave. N.W.

Faribault, Minnesota

Humphrey is the original Manlift Elevator, made continuously since 1887.

For more data circle 152 on Post Card

New Products . . .

ing process variables. LS-5 offers applications for the textile, pulp and paper, and chemical industries.

This new unit is a positive displacement-type pump with a leak-proof design, and has a maximum theoretical capacity of 1.1 GPH at 500 psig. The standard liquid handling parts are of stainless steel No. 20.

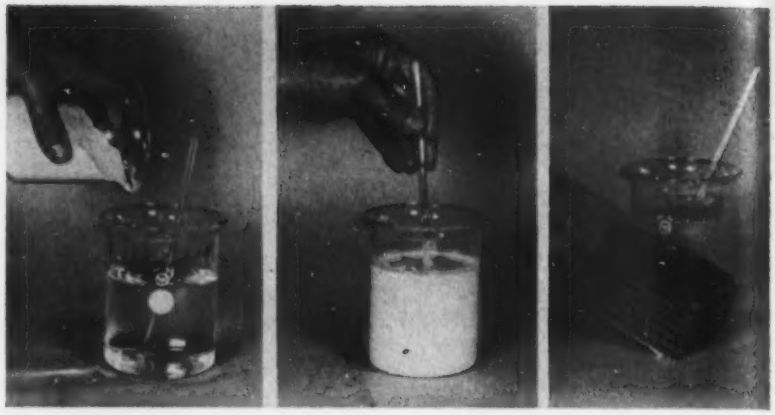
The Microflo LS-5 is also available as a Duplex pump with a single motor drive. The second unit, containing no gears, is coupled to the drive gear box through extended worm gear shaft and coupling. The pistons are normally located 180° out of phase to provide constant gear and motor loading. *Process Equipment Div., Lapp Insulator Co.*

Circle No. 23 on Readers' Service Card

Stainless steel propellers

A complete line of stainless steel replacement propellers to fit existing equipment are now offered in diameters of 3, 4, 5, 6, 7, 8, 10, 12, 14 and 16 in. Propellers are bored to the customer's specification and can be drilled to 1 in. maximum bore. *Terriss-Consolidated Industries.*

Circle No. 24 on Readers' Service Card



Cold-water-soluble dextrins

A new series of cold-water-soluble dextrins marketed under the brand name Koldex with the designations 20, 30 and 40, are designed to produce liquid adhesives in the 1,000 to 1,500 centipoise viscosity range measured at 80°F. The new dextrins are made by formulating regular specification dextrins with borax, preservatives and defoamers into a prepared liquid adhesive which is then spray dried. The result is precision-made dextrins of uniform size which dissolve readily in water at room temperature and yield adhesives of uniform, stable viscosities.

Koldex dextrins meet the same viscosity standards as the company's Stadex dextrins, but provide the added convenience of cold water solubility, the handling ease and economy of a dry product with the performance and dependability of a prepared liquid adhesive. Packed in 50-lb. paper bags, Koldex dextrins are ready for use by adding to water with agitation an hour before application. *A. E. Staley Mfg. Co.*

Circle No. 25 on Readers' Service Card

Kalamazoo

WOOD TANKS

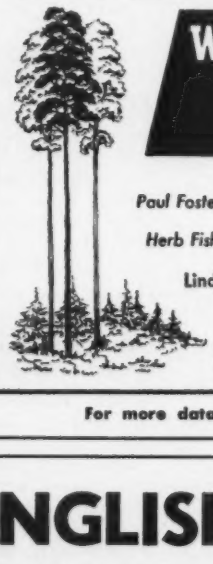
Built from best tank grade lumber. Backed by over 90 years' tank building experience. *Kalamazoo* can give you what you want. Free estimates and suggestions. Write today.

WOOD TANK DIVISION

Kalamazoo TANK and SILO COMPANY

1160 HARRISON ST., KALAMAZOO, MICHIGAN

For more data circle 153 on Post Card



WILLIAMS-GRAY COMPANY

221 North LaSalle Street

Chicago 1, Illinois

Serving the Paper Industry 1906

Paul Foster • Peter Talbot

Herb Fishburn • Wes Gallup • Bill French

Lindsay Wires

Knox Woolen Felts

Mount Vernon Dryer Felts

Carrier Rope, Splicing Tissues, Deckle Webbing, Apron Cloth, Wire Brushes

For more data circle 154 on Post Card

AMERICAN AND ENGLISH CLAYS

FOR ALL PAPER MAKING PURPOSES

ANGLO-AMERICAN CLAYS CORPORATION

(Formerly: English China Clays Sales Corporation)

6 East 45th Street, New York 17, N.Y.

For more data circle 155 on Post Card

NEW LITERATURE

Books

ASBESTOS: ITS INDUSTRIAL APPLICATIONS, by D. V. Rosato, Chief Engineer, Research Div., Plastics Plant, Raytheon Mfg. Co. Published by Reinhold Publishing Corp., Dept. B-294, 430 Park Ave., New York 22. Pages: 214. $5.75.

This book discusses the many uses of asbestos in industry and presents data on its properties and manufacturing methods. It is claimed to be a convenient guide to various industrial branches—research and development groups, manufacturers, engineering schools, market research groups and sales management.

The book also mentions the types of asbestos material available—asbestos cement, tile, asbestos heat and electrical insulation, asbestos friction materials, textiles, plastics, packings, gaskets and filters, etc. Also included is a census of asbestos products.

INDUSTRIAL PACKAGING, by Walter F. Friedman, V. P. of Dasol Corp., and Jerome J. Kipness, V. P. Atlantic Gummed Paper Corp. Published by John Wiley & Sons, New York. 518 pp. $11.50.

This book establishes criteria controls for the formulation and execution of sound packaging policy. It offers a thorough and up-to-date survey of packaging materials, methods, and equipment. The authors include an economic analysis of the field, and organize and define basic principles applicable to all package-using industries. While case histories are cited, the primary emphasis is placed on fundamental principles and complexities of the packaging systems.

USDA Reports

THE FOLLOWING REPORTS are available from the Director, Forest Products Laboratory, Madison 5, Wisconsin: No. 2175, Groundwood Pulping of White Fir and Corkbark Fir; No. 2162, Continuous Cold Soda Pulping of West Coast Red Alder, Tanoak, Madrone, and Bigleaf Maple; No. 200, List of Publications on Mechanical Properties and Structural Uses of Wood and Wood Products.

THE 1959 ANNUAL REPORT of the Southeastern Forest Experiment Station, U. S. Dept. of Agriculture Forest Service, Asheville, N. C. is now obtainable from Joseph F. Pechanec, Director. The contents of this report include: Forest Management, Forest Diseases, Forest Economics, Forest Fire, Forest Utilization, Range and Wildlife Habitat, Forest Insects, and Watershed Management.

Manufacturers' Publications

These items are numbered for your convenience. Copies of the publications may be requested at no obligation through our Readers' Service Dept. Use the handy business reply card which accompanies this issue.

Booklet for paper colorists

Sandoz Inc. has just published a booklet entitled, "Change for the Better". It covers information on the coloring of paper. Topics covered are: Dyes for paper; Specialties for papermakers; Dyes for stock; Dyes for surface application; Information on paper dye performance; For specific paper grades; and A ready-reference listing of dyes used in the trade.

Circle No. 26 on Readers' Service Card

Flexible shaft handbook

S. S. White Industrial Div. is announcing the fourth edition of their flexible shaft handbook. It is a simplified approach to the selection of flexible shafting through standard, pre-engineered, or custom-designed flexible shafts, and an informative guide to a new, simplified engaging system based on integral formed square drives, and the improved Series 7 and 9 flexible shafts. The handbook also describes in detail the advantages of flexible shafts, their function, successful applications, fundamental information on standard power drive and remote control shafts, uses of adapters and other accessories, and a section of tables and statistics valuable to the user.

Circle No. 27 on Readers' Service Card

Rotary union

Perfecting Service Co. is making available a brochure on the new features and improved seal of their ball-bearing rotary unions. The 19-page brochure illustrates and diagrams the new syphon

Available now — in book form

Adhesives in the Paper Industry

Compiled and edited by
A. W. J. Dyck

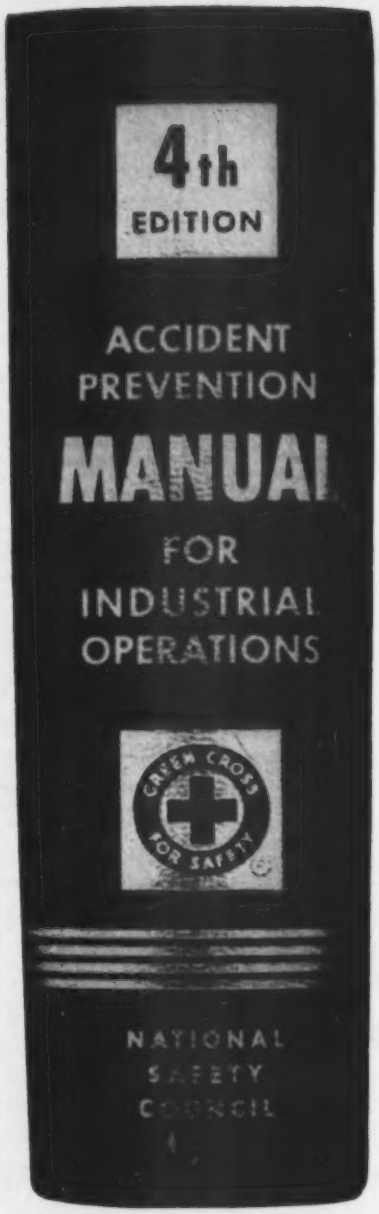
Editorial Director, The PAPER INDUSTRY

Latest developments in the use of adhesives by the paper industry are presented in a new book. This material originally appeared as a series of articles in The PAPER INDUSTRY from November 1958 to June 1960.

The series covers in detail: the economic and technical aspects of adhesives use; the theory of adhesion; the classification of adhesives; the types of adhesives used by the industry (animal-based, vegetable, inorganic, and synthetic resin adhesives); and the important adhesive forms.

Price $2.00 prepaid with order

Published by FRITZ PUBLICATIONS, INC.
431 South Dearborn Street, Chicago 5, Illinois



The new *4th Edition of the Accident Prevention Manual* contains over 1500 pages, over 500 illustrations and photographs—was reviewed by nearly 400 safety specialists from all industries before publication. It's the most complete, most accurate, most up-to-date safety manual available.

Single copy price $15.50. Use this stock number (121.51) when ordering.

NATIONAL SAFETY COUNCIL

425 North Michigan Ave., Chicago 11, Illinois
For more data circle 147 on Post Card

support, the monel bellows mechanical sealing mechanism, and the ground and hardened sealing mating surfaces.

Circle No. 28 on Readers' Service Card

Ductile iron valves and fittings

Stockham Valves & Fittings is offering a data bulletin and catalog on their ductile valves and fittings. The publication gives the description, size and list price of every model with further information on their nation-wide network of distributors.

Circle No. 29 on Readers' Service Card

Rotary levelator lifts

Rotary Lift Co. has published a bulletin describing the uses and variations of their levelator lifts. The 17-page illustrated bulletin demonstrates how the levelator lifts are used to speed plant traffic, lift heavy loads and prevent accidents in all types of industry.

Circle No. 30 on Readers' Service Card

Horizontal mixers

Sprout, Waldron & Co. Inc. has made available a bulletin giving compact information on modern horizontal mixers. The publication covers a variety of standard and special designs for mixing and blending of chemicals, food, feedstuffs, drugs, dyes and other products

Circle No. 31 on Readers' Service Card

Processing equipment

Dorr-Oliver Inc., in a revised 16-page brochure, illustrates and lists the distinguishing characteristics and applications of their 55 types of continuous processing equipment. Pilot plant equipment is also described, with special emphasis on classification, centrifuging, filtration and fluidization.

Circle No. 32 on Readers' Service Card

Equipment for chemical processing

Fuller Co. describes in a new 12-page bulletin, the equipment for the process industries. It discusses applications and performance characteristics of Fuller-Kinyon pumps, Airveyor pneumatic conveyors, etc. Operating principles are explained and photos show typical installations.

Circle No. 33 on Readers' Service Card

Conical refiner

John W. Bolton & Sons Inc. has made available a new bulletin describing the Emerson Claflin 303 continuous concial refiner for pulp and paper mills. Engineering drawings, sectional photographs and a descriptive text treats the performance features of this re-designed refiner.

Circle No. 34 on Readers' Service Card

Surface measure

Mellon Institute is offering a reprint of P. B. Davidson's article, A Measure of Surface Tension and Surface Film Elongation. First presented at the 45th Annual Meeting of the Technical Association of the Pulp and Paper Industry in New York, the article explains the use of the Instron tester to measure surface tension and force-ring displacement or surface-film elongation of animal glue dispersions. The conditions for the test method and a foaming test for such systems are described.

Circle No. 35 on Readers' Service Card

Adhesive sealing

Morningstar-Paisley Inc. is offering a reprint of a recently published five-page illustrated article on the causes and cures for adhesive sealing defects on the packaging line. The literature contains practical pointers to help the user gain optimum adhesive performance in his packaging operation. Subjects discussed include adhesive storage, handling and use, testing and control, and specifications for adhesives. A problem-solution chart included serves as a handy reference when a sealing defect takes place.

Circle No. 36 on Readers' Service Card

Calender sizing

A. E. Staley Mfg. Co. has published a 24-page brochure on calender starches. Illustrated with comparative charts and tables, the publication surveys types of starches used and their applications, includes numerous case histories and guidance on current application and preparation techniques.

Circle No. 37 on Readers' Service Card

Paper coating

Eastman Chemical Products Inc. has published a bulletin on their low-density tenite polyethylene for paper coating. Materials Bulletin No. 2 describes tenite polyethylene 895 P-60000 natural as having a nominal melt index of 3.5, a nominal density of 0.921, and uniform draw-down properties permitting coatings as thin as 0.2 mil.

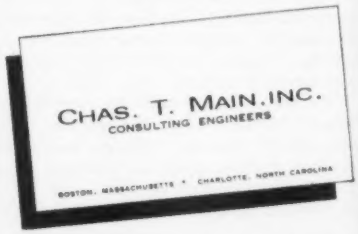
Circle No. 38 on Readers' Service Card

Professional and Business Services

J. E. SIRRINE COMPANY
ENGINEERS Since 1902
GREENVILLE, SOUTH CAROLINA

Design — Consultations
Paper & Pulp — Reports
Water & Waste — Appraisals
Steam & Hydro Power — Steam Utilization

Engineering for the PULP and PAPER INDUSTRY



Technical
SALES — SERVICE
RESIDE NEW ENGLAND.
Work from home representing manufacturer paper coating and filler pigment. Experience paper and coating desired. Also willingness to travel other areas as required. Send resume, photograph and salary required which will be treated in strict confidence. Box 709, The Paper Industry.

PAPER PULP MILL JOBS OUR SPECIALTY!

THE POSITION YOU WANT may be available right now. The demand for executives in increasing. Salaries are attractive. You are invited to send us your resume in confidence.

THE EXECUTIVE YOU NEED may be listed with us. Employers find our Service helpful and time saving.

Your phone call, wire or letter will bring prompt attention.

CHARLES P. RAYMOND SERVICE, Inc.
Phone Liberty 2-6547
294 Washington St. Boston 8, Mass.

ANY SPARE TIME?

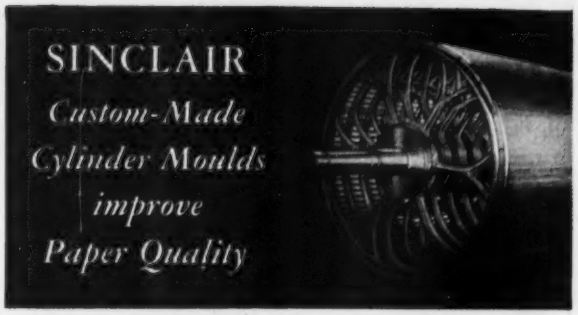
Make your paper mill knowledge add to your income. No selling. Confidential. Write Box 710, The Paper Industry.

DIRECTOR RESEARCH AND DEVELOPMENT

With large, long established, well known eastern manufacturer kraft pulp, paper, converted products. Require good scientific education, considerable experience; creative, practical, cooperative. Salary commensurate with qualifications. Inquiries confidential. Details to Allen Abrams, American Bank Building, Wausau, Wisconsin.

RESIDENT MANAGER

Substantial size fine paper and pulp producer in Northeast has excellent opportunity as Resident Manager. Will direct production; quality, process, and production control; material handling; warehousing, shipping and receiving; cost standards; maintenance; and technical sales service. Require 10 to 15 years of responsible line operating experience in the paper industry, including experience as Paper Mill or Finishing Room Superintendent. Knowledge of pulp desirable but not mandatory. Degree in Chemistry, Ch.E., or M.E., or equivalent. Age range 35-50. Salary $18-25,000. Please reply fully, in confidence, including earnings and size of mills. Our people know of this fine opening. Write Box 708, The Paper Industry.



SINCLAIR-MADE from Foundry to Cover!

Manufactured specifically for each individual job. Bronze spiders cast in our own foundry, finest rods of sufficient numbers to make a perfect surface, winding wires properly selected, plus our own wire cloth coverings engineered for each order mean a Cylinder Mould that has years of wear in it. Cylinders of Stainless Steel are a specialty with us too.

For Materials and Methods to Improve the Formation and Finish of Your Fine Papers . . . Write or Call:

THE SINCLAIR COMPANY
65 APPLETON STREET • JEfferson 2-9488
HOLYOKE, MASSACHUSETTS

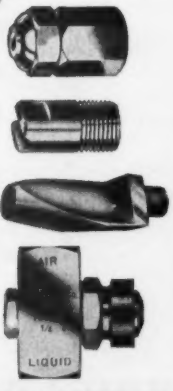
For more data circle 158 on Post Card

---

from tree to paper
SPRAYING SYSTEMS CO.
SPRAY NOZZLES

will help lower your costs

For every operation in spraying, from the heavy impact needed in debarking to the exactly controlled volume, distribution and spray angle essential in web spraying . . . Spraying Systems spray nozzles offer many advantages. Choice of capacities and selection of types is far greater in range . . . exclusive design features result in better performance. For complete information write for Catalog 24.

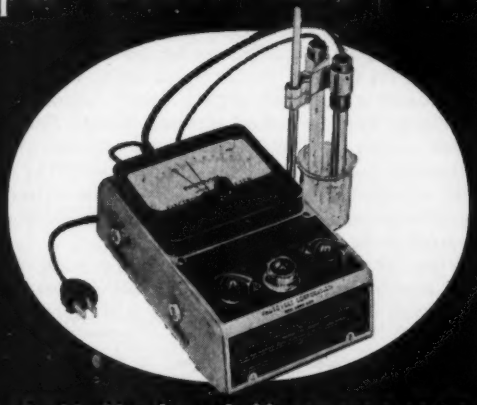


SPRAYING SYSTEMS CO.
3254 RANDOLPH STREET
BELLWOOD, ILLINOIS

If you have a special problem, write and let us know. Data Sheets are available covering a wide range of applications . . . or a field sales representative will be glad to call.

For more data circle 159 on Post Card

PHOTOVOLT
pH Meter MOD. 115



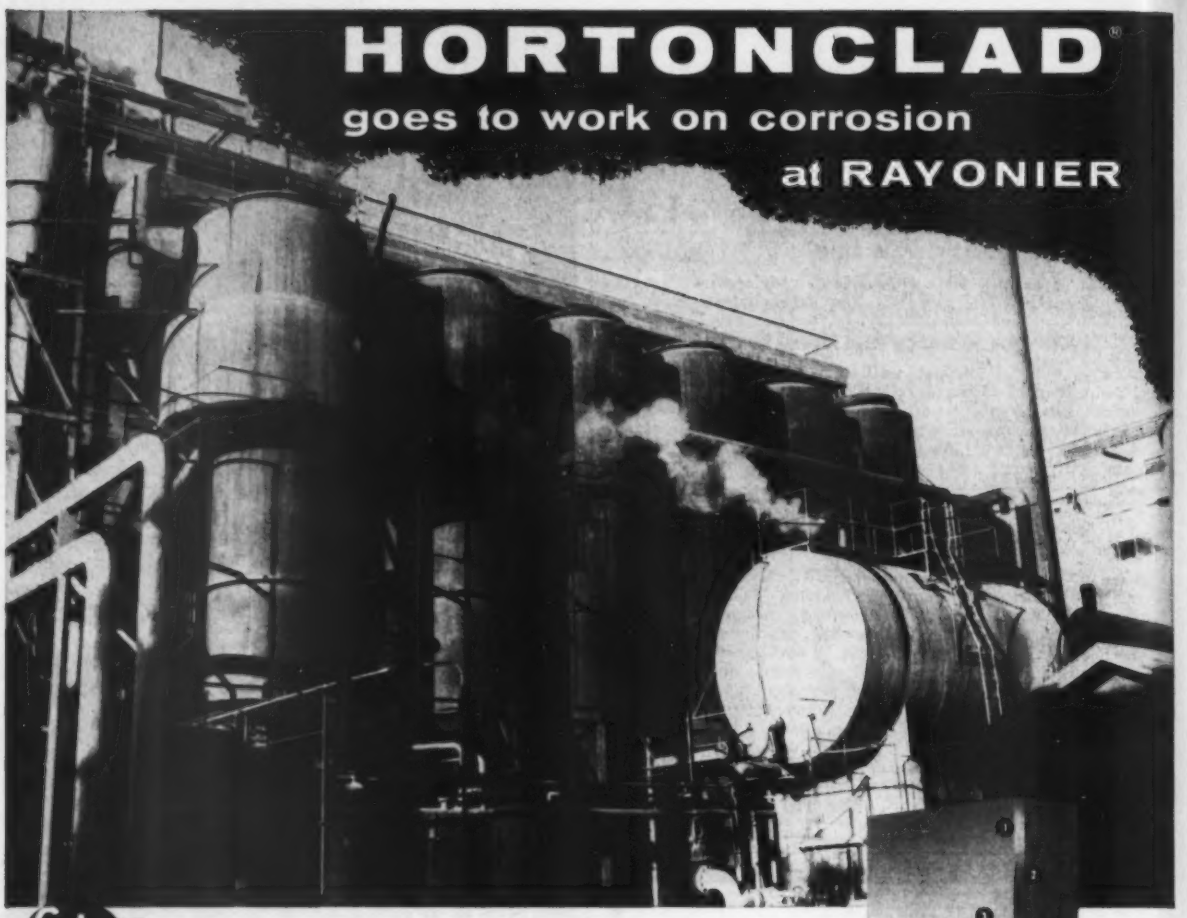
A full-fledged line-operated pH Meter of remarkable accuracy at the moderate price of **$175.-**
complete incl. electrodes

Write for bulletin # 225 to

PHOTOVOLT CORP.
95 MADISON AVE NEW YORK 16, N. Y.

For more data circle 160 on Post Card

HORTONCLAD®
goes to work on corrosion at RAYONIER



CB&I—built EVAPORATOR handles foam problem on black sulfate liquor

The corrosion-resistant properties of Hortonclad® were employed in the building of this six-body, sextuple effect Conkey® evaporator designed, fabricated and erected by CB&I for the Jesup, Georgia plant of Rayonier, Inc. Stainless steel Hortonclad was used for the No. 1 and No. 2 body, where protection from a high foaming type of sulfate black liquor was most needed. Structures were furnished through Ebasco Services, Inc.

Hortonclad, a CB&I composite metal having an integral and continuous bond, is an example of how CB&I's continuing program of *applied metallurgy* in steel plate construction is helping *us*—to help industry leaders attain better and longer performance life from storage and process vessels.

Write your nearest CB&I office for a copy of a bulletin which describes the extensive *co-ordinated* services and equipment which we furnish for the paper and pulp mill industry.

Photo above: Compact unitized, "out-of-door" construction such as this, is typical of the way CB&I-built evaporators help insure low installation and erection costs and maximum use of space.

these benefits with HORTONCLAD

1. Uniform Thickness
2. High Strength Bond
3. Clean, Contaminant-Free Surface
4. Adaptability to Any Size or Shape
5. Special Combinations of Metals

PP27-R

CHICAGO BRIDGE & IRON COMPANY

332 SOUTH MICHIGAN AVENUE
CHICAGO 4, ILLINOIS

OFFICES AND SUBSIDIARIES IN PRINCIPAL CITIES THROUGHOUT THE WORLD

For more data circle 161 on Post Card

MARKET QUOTATIONS

RAGS (Domestic)

New Cotton Cuttings

The following are brokers' and large dealers' average buying prices for sizeable lots in cents per pound f.o.b. New York:

	per cwt.
No. 1 white shirt cuttings	13.00— 13.50
Soft unbleached muslins	15.50— 16.00
Fancy shirt cuttings	4.50— 5.00
No. 1 percales	5.50— 6.00
No. 1 washables	2.25— 2.50
No. 1 light silesias	6.50— 7.00
No. 1 light prints	4.75— 5.00
Light flannelettes	6.50— 7.00
Cottonades	2.75— 3.25
Blue overall cuttings	6.75— 7.25
Blue cheviots	6.75— 7.25
Canton flannels, bleached	10.50— 11.00
Canton flannels, unbleached	10.50— 11.00
Osnaburg cuttings	9.50— 10.50
Underwear cuts, bleached	14.50— 15.00
Underwear cuts, unbleached	14.50— 15.00
Sun tan khaki cuttings	5.00— 5.50
American linen cuttings	6.75— 7.25

Cotton Rags

The following are prices, cents per pound, paid by dealers and brokers f.o.b New York:

	per cwt.
No. 1 roofing (Chicago)	.55— .60
No. 2 roofing (Chicago)	.40— .45
Twos and blues, repacked	1.75— 2.00
Thirds and blues, repacked	1.50— 1.75
No. 1 whites, repacked	—
No. 1 whites miscellaneous	—
No. 2 whites, repacked	—
No. 2 whites, miscellaneous	—

RAGS (Foreign)

(ex dock New York City)

New Rags

per cwt.

Nominal:
- New dark cuttings
- New mixed cuttings
- New light silesias
- Light flannelettes
- Unbleached cuttings
- New white cuttings
- New light oxfords
- New light prints

Old Rags

per cwt.

Nominal:
- No. 1 white linens
- No. 2 white linens
- No. 3 white linens
- No. 4 white linens
- No. 1 white cottons
- No. 2 white cottons
- No. 3 white cottons
- No. 4 white cottons
- Extra light prints
- Ordinary light printe
- Medium light prints
- Dutch blue cottons
- French blue cottons
- French blue linens
- Checks and blues
- Linsey garments
- Dark cottons
- Old shopperies

ROPE and BAGGING

F.o.b. and ex dock New York City

Gunny No. 1, domestic	—
Gunny No. 1, foreign	—
No. 1 manila rope, domestic	—
No. 1 manila rope, foreign	—
New burlap cuts (soft)	—
Sisal strings	—
Mixed strings	—

WASTE PAPER

The following are prices, dollars per net ton, paid by brokers and large dealers for carload quantities of baled stock, f.o.b. cars New York:

No. 1 hard white envelope cuttings	95.00—100.00
No. 1 hard white shavings	80.00— 85.00
No. 1 soft white shavings	50.00— 55.00
Soft white shavings, uncoated	60.00— 65.00
Fly leaf shavings No. 1	17.00— 22.00
Fly leaf, woody, No. 1	17.00— 20.00
Mixed colored shavings	16.00— 18.00
No. 1 books and magazines	18.00— 20.00
Ledger stock, white, No. 1	40.00— 45.00
Ledger stock colored, No. 1 (Midwest ship)	30.00— 32.50
New manila envelope cuttings (free of groundwood)	55.00— 60.00
New manila envelope cuttings (containing groundwood)	45.00— 50.00
Manila tab cards	55.00— 60.00
Colored tab cards	42.50— 45.00
New northern kraft envelope cuttings	55.00— 60.00
Triple sorted kraft, 100%	35.00— 37.50
No. 1 old kraft	25 00—
White news cuts, No. 1	40.00— 45.00
No. 1 overissue news	15.00— 17.00
Folded news, special	13.00— 14.00
Folded news, ordinary	11.00— 12.00
Old corrugated boxes	15.00— 16.00
New jute corrugated cuts	19.00— 20.00
Mill wrappers	9.00— 11.00
Boxboard cuttings	4.00— 5.00
No. 1 mixed paper	1.00— 6.00

CHEMICALS

F.o.b. New York City

Alum, ammonium	
Granular, bags, works, cwt.	4.30—
Lump, drums, works, cwt.	5.05—
Powdered, drums, works, cwt.	5.20—
l-Arginine, drums, kilo	90.00—
Blanc Fixe	
Direct process, bags, c.l., works, ton	160.00—
L. c. l., ton	170.00—
Bleaching Powder, drums, cwt.	—
Casein, domestic acid precipitated	
30-mesh bags, 10,000-lb. lots or more, shipping point, lb.	.56—
80-mesh bags, 10,000-lb. lots or more, shipping point, lb.	.64—
China Clay, domestic dry-ground, airfloat, 99%	
325-mesh bags, c.l., Georgia works, ton	11.00— 17.00
300-mesh bags, c.l., Georgia works, ton	13.50— 22.50
Imported, white, lump, bulk, c. l., ex dock Phila, Portland, Me., gross ton	23.00— .35.00
Chlorine, liquid	
Tanks, single units, works, freight equaled, cwt.	3.25—
Glycerine, refined (CP, USP) 99%, drums c. l., delivered lb.	.30⅞—
Litharge, commercial powdered	
Barrels c. l., works, freight equaled lb.	.14⅛—
Rosin, gum, c. l., f.o.b. New York, cwt.	
K, M	17.75—
N	17.85—
WG	18.10—
WW	18.25—
Rosin, wood, c. l., f.o.b., shipping point, cwt.	
K, M	13.35— 15.25
N	13.45— 15.60
WG	13.55— 15.85
WW	13.88— 16.25
Saltcake, domestic, bulk works, 100% Na_2SO_4 basis ton	28.00—
Soda Ash	
Dense, 58%, paper bags, c.l. works, cwt	1.90—
Light, 58%, paper bags, c.l. works, cwt	1.85—
Soda, caustic	
Flake, 76%, drums, c. l. works, freight equalled, cwt	5.20—
Solid, 76%, drums, c. l. works, cwt.	4.80—
Sodium Silicate	
40°Be, 1:3.2, turbid, drums, c. l., works, cwt.	1.65—
52°Be, turbid, 1:2.4, drums, c. l., works, cwt.	2.65—
Starch	
Pearl, 140-lb. bags, cwt.	7.51—
Pearl, 100-lb. bags, cwt.	7.36—
Powdered, 100-lb. paper bags, cwt.	7.48—
Sulfur, crude	
Bulk, c. l. mine, contract, long ton	23.50—
Talc	
Domestic, fibrous, N. Y., grd., bags, c. l. works, ton	28.00—
Canadian, ground, bags, c. l. works, ton	20.00— 35.00
Titanium Pigment	
Calcium-rutile base, regular, bags, c. l., lb.	.09⅜—
High-tinting, drums, c. l., lb.	.14⅜—
Zinc Oxide Pigment, American process	
Lead-free, bags, c. l. freight allowed, lb.	.14½—
Leaded, 35%, bags, c. l., freight allowed, lb.	.15⅜—

WOOD PULP

Quotations on domestic and Canadian pulp, dollars per short air-dry ton delivered consuming mills including basic allowances, follow:

Bleached sulfite, No. 1	155.00—
Bleached sulfite, Canadian	155.00—
Unbleached sulfite	135.00—
Unbleached sulfite, Canadian	135.00—
Bleached soda	150.00—
Bleached soda, Canadian	150.00—
Kraft, bleached hardwood	152.00—
Kraft, bleached	157.00—
Kraft, bleached southern	160.00—
Kraft, bleached Canadian	160.00—162.50
Kraft, unbleached southern	120.00—
Kraft, unbleached, Far West	125.00—
Kraft, unbleached Canadian eastern	135.00—
Kraft, unbleached Canadian western	128.00—125.00
Kraft semi-bleached southern	140.00—
Sulfite screenings	—
Sulfate screenings	—

Quotations on imported wood pulp dollars per short air-dry ton on dock American Atlantic ports, follow:

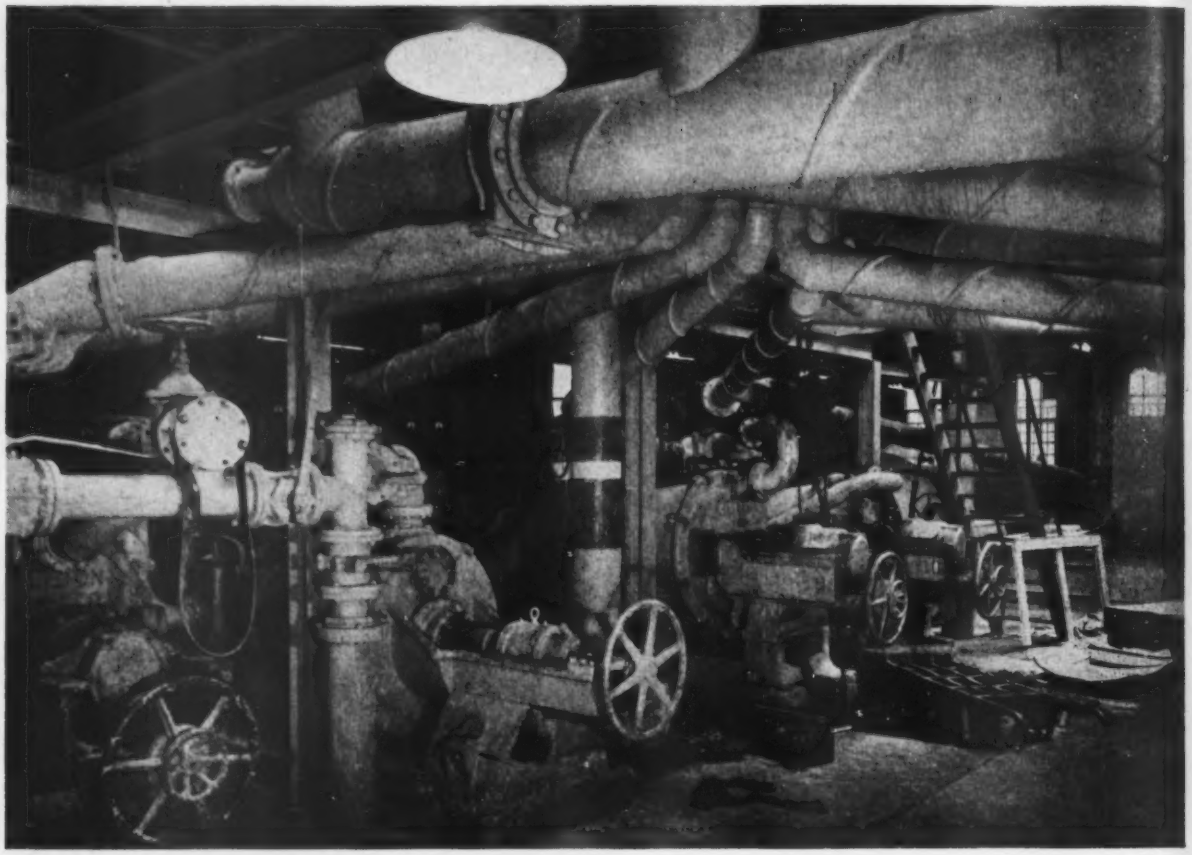
Bleached sulfite Swedish, freight allowed	155 00—
Bleached sulfite, Norwegian, del'd with limited freight allowance	155 00—
Bleached sulfite, Finnish, freight allowed	155 00—
Unbleached sulfite, Swedish, freight allowed	135 00—
Unbleached sulfite, Finnish, freight allowed	135 00—
Kraft, unbleached, Swedish, freight allowed	125 00—
Kraft, unbleached, Finnish, freight allowed	125 00—
Kraft, bleached, Swedish, on dock	157 50—162.50
Kraft, bleached, Norwegian	155 00—

PAPER

Quotations are mill quotations Chicago

Boards (prices per ton, delivered in Chicago, 10 tons or more):	
Plain chip	107.50
News vat lined chip	110.00
.009 chip, rolls	100.00
Filled news	111.50
Solid news	114.50
White vat lined chip	144.50
Chip tube and can stock	112.50
Single manila lined chip	162.50
Single jute lined chip	147.50
Container, 42-lb.	
Kraft liner (per 1000 sq. ft.)	2.68
White patent coated	
.020	175.00
.018	177.50
.016	182.50
Book Paper (f.o.b. Chicago, c.l skids per cwt):	
No. 1 enamels	20.80
No. 2 enamels	19.80
Machine-coated, 45- to 100-lb.	15.55— 19.00
60-lb + uncoated offset, 25 × 38 (2000 lb.)	22.25
"A" grade English finish untrimmed, 25 × 38 (2000 lb.)	21.10
Rag Content Bond (white, 5000 to 10,000-lb. sub 20, ream sealed cartons):	per cwt
100% rag	—
75% "	—
50% "	—
25% "	—
Rag Content Ledger (white, 5000 to 10,000 lb., ream sealed cartons):	
100% rag	—
75% "	—
50% "	—
25% "	—
Sulfite Bond (white, 5000 to 10,000-lb. sub 20, ream sealed cartons):	
No. 1	—
No. 2	—
No. 4	—
Sulfite Ledger (white, 5000 to 10,000-lb., ream sealed cartens):	
No. 1	—
No. 2	—
No. 4	—
Newsprint (contract base price)	per ton
Rolls, standard	135.00
Sheets	Standard differentials
Kraft Wrapping — Natural (standard rolls 9- and 15-in. diam.)	per cwt
70-lb. and heavier	9.00
60-lb	9.25
50-lb.	9.50
40-lb.	9.75
35-lb.	10.25
30-lb.	11.00
25-lb.	11.75
20-lb.	12.75
No. 1 Kraft Butcher — Pink	per cwt
40-lb. only	10.50
Sheets — Plus 50c cwt)	

GEARED TO YOUR PIPING NEEDS



NAYLOR FABRICATIONS *in*
Carbon Steel, Alloys or Stainless Steel

NAYLOR Fabrication Service can give you paper mill pipe, fittings and special fabrications to meet your exact specifications—from carbon steel, alloys or stainless steel, fabricated to close tolerances.

Pipe sizes from 4″ to 30″ in diameter and wall thicknesses from 14 to 8 gauge. Special piping fabrications from 3″ to 44″ in diameter and wall thickness up to ⅜″. Standard fittings are available from stock.

Write for Bulletin No. 59 or send specifications for quotation.

NAYLOR PIPE *Company*

1233 East 92nd Street, Chicago 19, Illinois

Eastern U. S. and Foreign Sales Office: 60 East 42nd Street, New York 17, N. Y.

For more data circle 162 on Post Card

Index to Advertisers

Albany Felt Company 553
Allied Chemical Corp., General Chemical Division
American Defibrator, Inc.
American SF Products, Inc.
Ampco Metal, Inc. 546
Anglo-American Clays Corporation 624
Anheuser-Busch, Inc.
Antara Chemicals
Appleton Wire Works, Inc. 621
Appleton Wood Products Co. 613
Armstrong Machine Works
Asten-Hill Mfg. Co.
Atlantic Coast Line Railroad
Atlas Refinery, Inc.

Babcock & Wilcox Co., The, Tubular Products Div. 592
Baird Chemical Industries
Bauer Bros. Co., The
Beloit Iron Works 579-580
Bird Machine Company 590
Black-Clawson Company, The 594
Bolton & Sons, Inc., John W. ..... 2nd Cover

Carthage Machine Co.
Celgar Limited 611, 613, 615
Chicago Bridge & Iron Company 628
CIBA Company, Inc. 596
Classified Advertising 626, 627
Clinton Corn Processing Co. 550
Conoflow Corporation

Darling & Company
Dearborn Chemical Company
Dempster Brothers
De Zurik Corporation 610
Diamond Power Specialty Corp. 545
Dow Chemical Co. 556
Dow Corning Corporation 593
Draper Brothers Company 600
Du Bois Chemicals, Inc.

Egan & Co., Frank W.
Electric Eye Equipment Company

Fabri-Valve Company of America 612
Fairbanks, Morse & Company

Foote Bros. Gear & Machine Corp. 614
Fritz Publications, Inc. 625

General Dyestuff Company 605
Georgia Kaolin Company ..... 4th Cover
Goslin-Birmingham Mfg. Co., Inc.

Hamblet Machine Co.
Hanchett Manufacturing Co. 631
Hubinger Company, The
Humphrey Elevator Company 623
Huyck Felt Co. 584-585

Illinois Gear & Machine Co.
Improved Machinery, Inc. 616
Inglis Co. Limited, John 583

Jamesbury Corp. 609
Jenkins Sons, Inc., M. W. 620
Johnson Corporation, The 614
Joliet Equipment Co.
Jones Corporation, E. D. 558

Kalamazoo Tank & Silo Co. 624
Kamyr, Inc.

Lake Engineering Company
Lamb-Grays Harbor Co., Inc.
Langston Co., Samuel M. 554
Layne & Bowler, Inc. 618
Lestoil, Inc.
Lincoln Engineering Co. 552
Lindsay Wire Weaving Co., The
Link-Belt Company
Lodding Engineering Corp. 602

Marathon, Div. of American Can Co. 551
Moisture Register Co.
Mullis Eng. & Mfg. Co., Carl W.
Murray Mfg. Co., D. J.

Nashua Industrial Machine Corp.
National Safety Council 626
Naylor Pipe Company 630
Nichols Engineering & Research Corp. 622
Norfolk and Western Railway 589
Northwest Engineering Company
Norgren Co., C. A.
Norton Company

Orr Felt & Blanket Co.
Overly's Incorporated 601

Paper Converting Machine Company 559
Paper Industry, The 625
Parsons & Whittemore Inc.
Penick & Ford, Ltd., Inc. 555
Perkins & Son, Inc., B. F.
Photovolt Corporation 627
Poirier Control Company
Portland Copper & Tank Works, Inc. 600
Post Machinery Co.

Charles P. Raymond Service, Inc. 627
Reichhold Chemicals, Inc.
Ross Engineering, J. O.
Ross Midwest Fulton Corp. 604
Roy & Son, B. S.

Sandy Hill Iron and Brass Works
Scapa Dryers, Inc.
Screw Conveyor Corporation 599
Shuler & Benninghofen 597
Sinclair Company, The 627
Smidth & Co., F. L. 608
Sonoco Products Company 560
S-P Manufacturing Corp., The
Spraying Systems Co. 627
Staley Mfg. Co., A. E.
Standard Oil Co. (Indiana) 557
Stebbins Engineering & Mfgr. Co. 607
Steinen Mfg. Co., Wm., Industrial Nozzle Div. 611
Stickle Steam Specialties Co.
Swenson Evaporator Company 561
Swiss Colony, The

Taylor-Wharton Co. ..... 3rd Cover
Tennessee Corporation
Texas Gulf Sulphur Co.
Transall, Inc. 619

Union Asbestos & Rubber Co.

Valley Iron Works Corp.
Vanderbilt Co., R. T. 548
Vulcan Iron Works 615

Weyerhaeuser Timber Co.
Whiting Corporation 561
Whitney Chain Company
Williams-Gray Company 624
Wisconsin Wire Works 606

Professional & Business Service Section
Sirrine Company, J. E. 626
Main, Inc., Charles T. 626

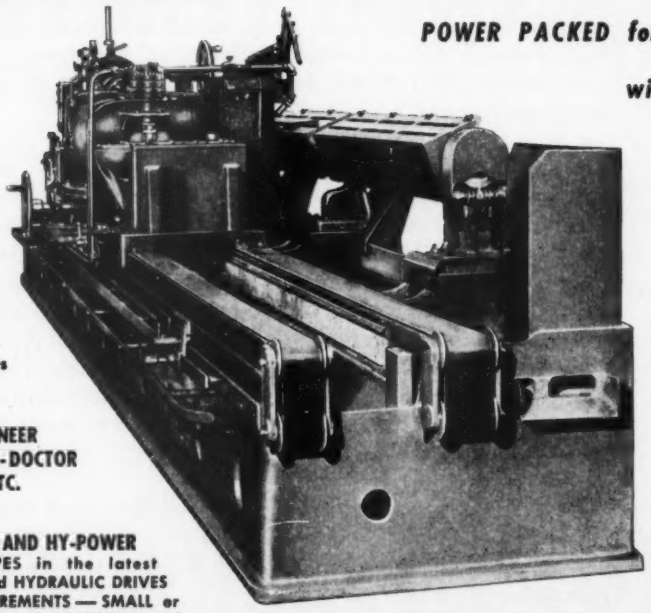
HANCHETT TRAVELLING WHEEL TYPE KNIFE GRINDER

MODEL AK AUTOMATIC

EXTRA HEAVY DUTY

SPECIFICATIONS

Capacity—84" to 396" lengths; Motors — 7½ to 40 H.P., Balanced; Drives — Mechanical - Hydraulic; Speeds—10' to 150 ft. per min.; Wheels—16"-20"-24" Dia.; Types — Cylinder - Segmental; Bearings — 100% Ball and Roller Types



POWER PACKED for HIGH PRODUCTION with PRECISION ACCURACY

SMOOTH RUNNING
QUIET
VIBRATIONLESS

WE GUARANTEE

1 — More and Better Knives for Less
2 — Finer Finishes with Greater Accuracy
3 — Cleaner Cut Material
4 — Reduced Knife Costs
5 — Longer Knife Life with Less Changes

Send Us Your Knife Problems

FOR CHIPPER-HOG-PAPER-VENEER KNIVES-ROTARY CUTTERS-DOCTOR BLADES-SHEAR BLADES-ETC.

OTHER MODELS - DN - GK AND HY-POWER TRAVELLING TABLE TYPES in the latest MECHANICAL-ELECTRIC and HYDRAULIC DRIVES to meet ALL KNIFE REQUIREMENTS — SMALL or LARGE from 32" to 240" with MOTORS 3 H.P. up to 75 H.P.

Built by Master Craftsmen

HANCHETT MANUFACTURING COMPANY

Main Plant BIG RAPIDS, MICH.
West Coast PORTLAND (1) OREGON

For more data circle 163 on Post Card

PAPER INDUSTRY

Whither?

... in production, processes, new products, markets

Effect of some organic substances on oxygen absorption in bubble aeration

Experiments now in progress at the Chemical Engineering Department of the University of Maine show that alcohols and carboxylic acids effected a definite improvement in the rate of oxygen transfer and that such transfer increased progressively with the length of the carbon chain of the alcohols and carboxylic acids used.

The most effective substances were 4-methyl-2-pentanol and isoamyl acetate which at concentrations of 3.0 ppm and 6.6 ppm increased the efficiency of absorption by 50 and 100 per cent respectively.

Vacuum requirements for paper machines

Vacuum producing equipment of high speed modern paper machines is now near the 2000-hp range, with some high tonnage kraft board machines approaching the 3000-hp requirements, according to F. A. Taska of Clark & Vicario Corp. This points to an ever increasing dependence of the paper machine on the vacuum system.

Radiant heat for paper drying

It has been found that a single 500,000 btu burner is equivalent to 1 1/3 dryers of equal length, 48 in. dia. and 60 psi steam pressure. An average installation that would provide approximately a 10 per cent increase in drying capacity of an average mill would cost $6000-$10,000, according to E. S. Mack of Hupp Corp.

Advantages of the infrared energy drying system include: (1) It is faster because startup and stopping are instantaneous, no warmup period being required; (2) operation and consumption are simple and more economical; (3) the energy can be focused, reflected or polarized; (4) it is not affected by air currents; (5) proper design will produce a uniform radiant flux intensity where required.

Ductile iron in the pulp and paper industry

Ductile iron, a cast iron in which graphite particles are present in a spheroid form, is ideally suited for equipment and structures where the mechanical strength of mild steel and the corrosion resistance of cast iron are required, according to E. G. Holmberg of the International Nickel Co. Inc.

Among its applications in the pulp and paper industry are listed: (1) in jordan plugs where it has a decided advantage over cast steel because of better machineability and elimination of galling; (2) in replacing both cast iron and steel gears, where it shows better performance; (3) in crownless press rolls, where its high modulus of elasticity reduces deflection and eliminates the costly crowning operation; (4) application in pumps, valves, compressor cylinder liners, machinery frames, etc.

Alkaline digester corrosion

The average current corrosion rate for carbon steel digesters, based on the weighted average, has increased from 28.2 to 36.2 mils per year, while the average corrosion rate in the critical areas of these digesters has increased from 69.1 to 81.5 mils per year.

The corrosion rate of 36.2 mils per year for carbon steel digesters compares with 3.3 mils per year for Inconel lined and clad digesters and 6.1 mils per year for stainless steel digesters.

TISCO®

PULP WOOD CONVEYOR CHAIN

Users of TISCO Pulp Wood Conveyor Chain, referring to its outstanding performance say, "The more you abuse it, the tougher it gets." This is hardly an exaggeration. The chain is made of TISCO manganese steel. Under sufficient impact, its hardness may be increased from the original 190 BHN to more than 450. Discover for yourself the lower operating costs resulting from the durability and dependability of TISCO Pulp Wood Conveyor Chain. Contact:

TAYLOR-WHARTON CO.

DIVISION OF HARSCO CORPORATION

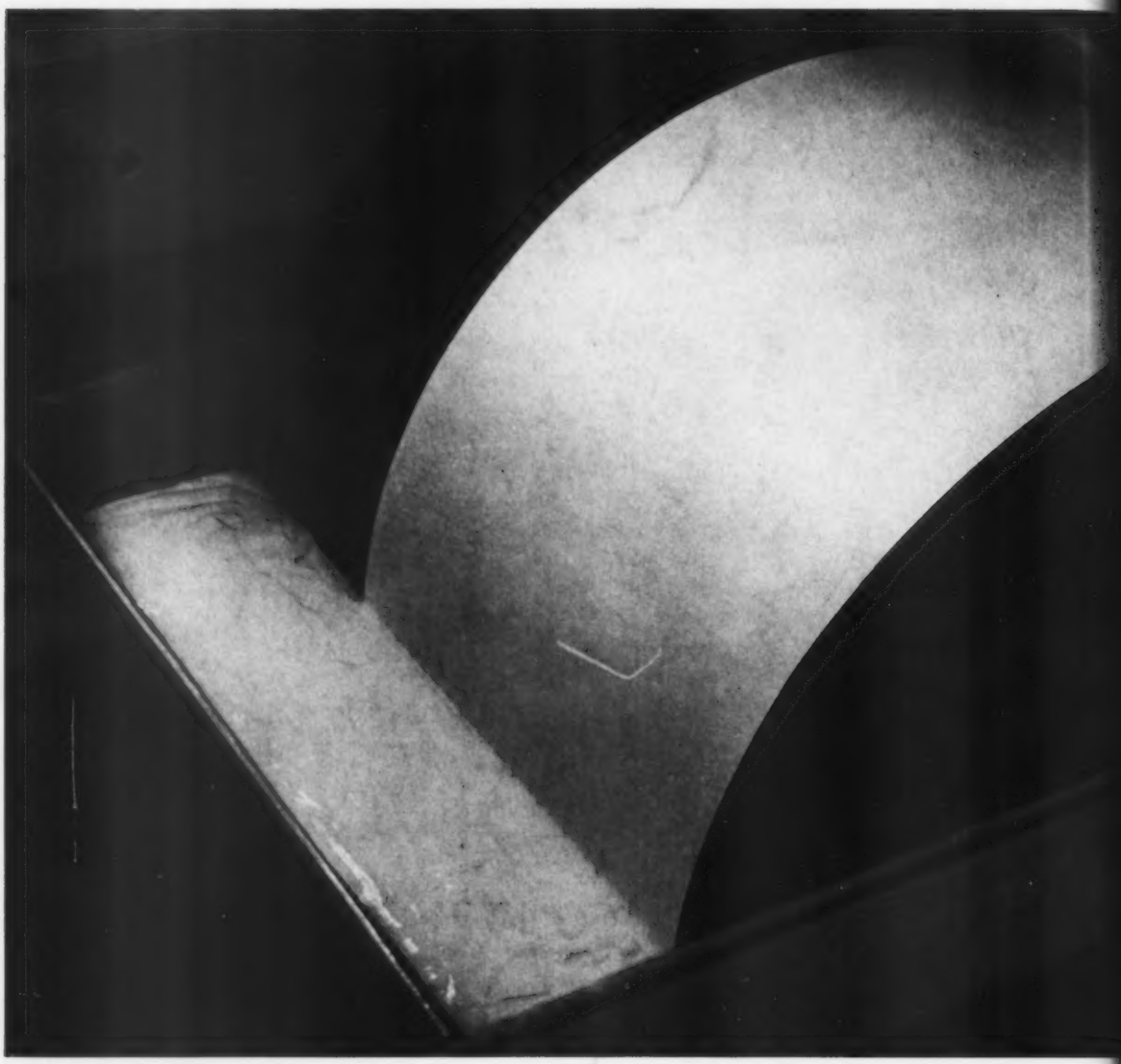
Established 1742

HIGH BRIDGE 5, NEW JERSEY

PLANTS: Cincinnati, O. — Birmingham, Ala. — Easton, Pa.

SALES OFFICES: New York — Chicago — San Francisco

For more data circle 164 on Post Card



Want to know what your paper would look like coated?

Georgia Kaolin's Sales Service Department operates pilot plant trailing blade, air knife and roll coaters. Many paper mills have found these facilities very helpful in determining the effects of different coating methods and formulations on their own raw stock.

G-K's research personnel and facilities are also being used by many companies both large and small, for assistance in other areas such as clay handling, clay make-down, filling techniques, coating color formulation and preliminary runs and evaluations of new products.

These facilities are at your disposal . . . can be a valuable supplement to your research and development studies.

Georgia Kaolin Company

433 North Broad Street, Elizabeth, New Jersey

Fine clays from the world's largest kaolin plant.

For more data circle 165 on Post Card